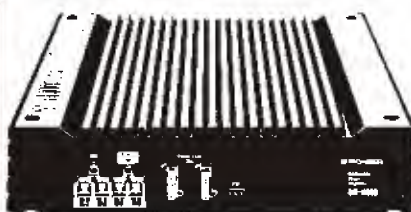


Service Manual

PIONEER
The Art of Entertainment

• GM-H200/UC



ORDER NO.
CRT1381

BRIDGEABLE POWER AMPLIFIER

GM-H200 UC

GM-4200 EW

NOTE:

- In this unit, an electric current of about 40A flows at the continuous power output of 4 Ω and a current close to 60A flows at 2 Ω . Even when there is no signal, a current around 4A flows. Therefore, make a test at an appropriate signal level in consideration of the power consumption of the power supply unit.

CONTENTS

1. SPECIFICATIONS	2	8. CONNECTION DIAGRAM (UC)	18
2. CONTROLS AND THEIR USE (UC)	3	9. SCHEMATIC CIRCUIT DIAGRAM (UC)	21
3. CONNECTING THE UNITS (UC)	4	10. SCHEMATIC CIRCUIT DIAGRAM (EW)	24
4. CONTROLS AND THEIR USE (EW)	7	11. CONNECTION DIAGRAM (EW)	27
5. CONNECTING THE UNITS (EW)	9	12. EXPLODED VIEW	30
6. DISASSEMBLY	13	13. PACKING METHOD	33
7. CIRCUIT DESCRIPTION	15	14. ELECTRICAL PARTS LIST	34

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan

PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.

PIONEER ELECTRONICS OF CANADA, INC. 505 Cochrane Drive, Markham, Ontario L3R 8E3 Canada

PIONEER ELECTRONIC [EUROPE] N.V. Keetberglaan 1, 9120 Beveren, Belgium

PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-9911

© **PIONEER ELECTRONIC CORPORATION 1991**

FA MAY 1991 Printed in Japan

SAFETY INFORMATION (UC MODEL)

CAUTION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual. Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5). When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

1. SPECIFICATIONS

• GM-H200/UC

Power source	14.4 V DC (10.8 - 15.6 V allowable)
Grounding system	Negative type
Current consumption	40 A (at continuous power, 4Ω)
Average current drawn*	13 A (4Ω for two channels) 18 A (4Ω for one channel)
Fuse	30 A x 2
Dimensions	264 (W) x 58 (H) x 335 (D) mm [10 - 3/8 (W) x 2 - 1/4 (H) x 13 - 1/4 (D) in.]
Weight	7.0 kg (15.4 lbs.) (Leads for wiring not included)
Maximum power output	200 W x 2/600 W x 1 (EIAJ)
Continuous power output	100 W x 2/300 W x 1 (at 4Ω, 20 - 20,000 Hz, 0.05% THD) 150 W x 2 (at 2Ω, 20 - 20,000 Hz, 0.05% THD)
Load impedance	4Ω (2 - 8Ω allowable)
Frequency response	10 - 50,000 Hz (+0 dB, -1 dB)
Signal-to-noise ratio	105 dB (IHF - A network)
Distortion	0.001% (at 20 W, 1 kHz)
Separation	70 dB (1 kHz)
Input level	0.2 - 2 V / 8 kΩ

These specifications were determined and are presented in accordance with specification standards established by the Ad Hoc Committee of Car Stereo Manufacturers.

Note:

Specifications and the design are subject to possible modification without notice due to improvements.

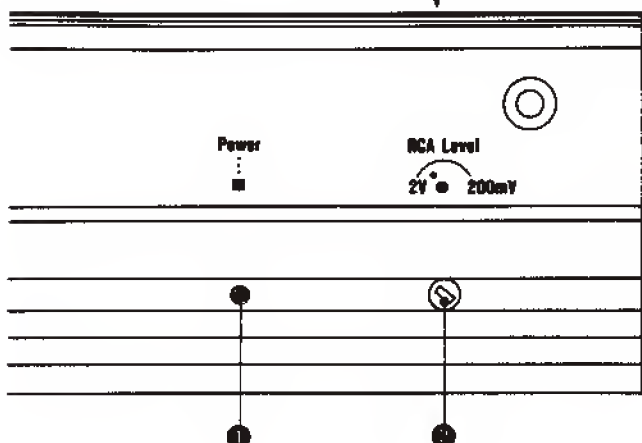
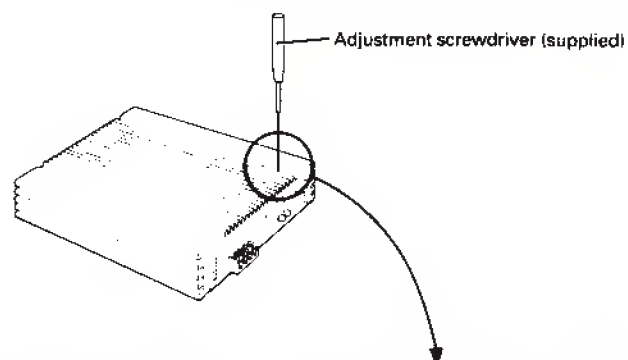
• GM-4200/EW

Power source	14.4 V DC (10.8 - 15.6 V allowable)
Grounding system	Negative type
Current consumption	40 A (at continuous power, 4Ω)
Average current drawn*	13 A (4Ω for two channels) 18 A (4Ω for one channel (2Ω position))
Fuse	30 A x 2
Dimensions	264 (W) x 58 (H) x 335 (D) mm
Weight	7.0 kg (Leads for wiring not included)
Maximum power output	240 W x 2/640 W x 1 (EIAJ)
Continuous power output	120 W x 2/320 W x 1 (at 4Ω, 20 - 20,000 Hz, 0.05% THD) 160 W x 2 (at 2Ω, 20 - 20,000 Hz, 0.05% THD)
Load impedance	4Ω (2 - 8Ω allowable)
Frequency response	5 - 50,000 Hz (+0 dB, -1 dB)
Signal-to-noise ratio	105 dB (IEC - A network)
Distortion	0.0009% (at 20 W, 1 kHz)
Separation	70 dB (1 kHz)
Input level	RCA: 0.4 - 4 V / 8 kΩ DIN: 70 - 500mV / 22 kΩ

Note:

Specifications and the design are subject to possible modification without notice due to improvements.

2. CONTROLS AND THEIR USE (UC MODEL)



① Power Indicator

The power indicator lights when the power is switched on.

② RCA Input Level Control

Adjusting the RCA input level control will help match the output of the car stereo to the Pioneer amplifier. If the output is low even when the volume of the car stereo is turned up, turn this control clockwise. If there is distortion when the volume of the car stereo is turned up, turn this control counterclockwise.

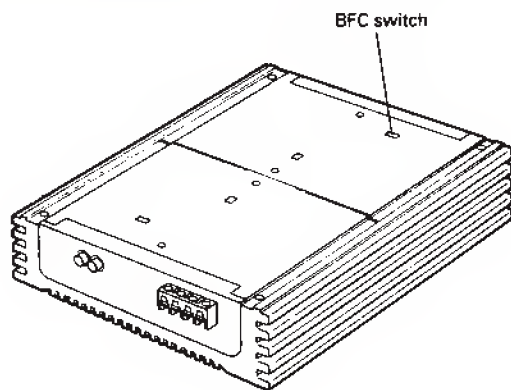
- Adjust control ② with the supplied adjustment screwdriver. Keep the screwdriver if you need to readjust the controls later.

BFC (Beat Frequency Control) switch

Note:

Beating is the combining of two or more frequencies to produce sum and difference frequencies called beats.

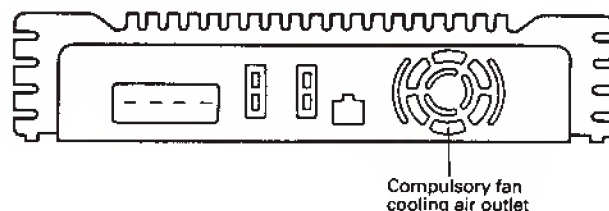
If beating is heard when listening to AM stations on your car radio, change the position of the BFC switch on the bottom of the amplifier with a small flat-bladed screwdriver.



Compulsory fan cooling system

This is a high-power amplifier, so it produces a lot of heat. To keep it cool, it has fan cooling.

- When the power of the car stereo is turned on, the compulsory cooling fan of this power amplifier works automatically and cools inside of this amplifier.
- Install the amplifier so there is enough space front and back to allow the fan cooling to work properly. If the front or back side is covered, the amplifier may malfunction or fail.



3. CONNECTING THE UNITS (UC MODEL)

WARNINGS

- When routing leads and cords, secure them with cable retainers and electrician's adhesive tape. Also, to prevent any damage to the insulation on the leads and cords, protect them with electrician's adhesive tape wherever they touch sharp edges. Be sure to use a rubber O-ring grommet when routing wires through metal, such as the firewall between the engine and passenger compartments.
 - Keep all wiring away from hot surfaces or heater outlets to prevent short circuits.
 - Amplifier ground connections (Black) should only be made to the vehicle's metal body or chassis for safety reasons. The ground circuit carries the same current as the power lead from the vehicle's battery. To get good contact when grounding, sand the metal surface to expose the bare metal. If using multiple amplifiers, connect all amplifier ground leads to the same point to prevent noise problems.
 - Always connect the supplied special (red) battery lead directly to the positive (+) terminal of the battery.
- It is recommended that the speakers connected to the amplifier have the minimum ratings shown below. If a speaker has a rating below what is recommended, it may be damaged when the volume is turned up. The speaker impedance must be 2 to 8 ohms.

Mode	Speaker ratings	
	Maximum	200 W
Two-channel	Nominal	100 W
	Maximum	600 W
One-channel	Nominal	300 W

In the case of a full-range speaker, use one whose maximum rating is higher than the maximum rating shown. In the case of a sub-woofer, use one whose nominal rating is higher than the nominal rating shown.

- Never connect a speaker lead to ground or to other speaker grounds. The protection circuitry will operate instantaneously, turning off the amplifier.
- To prevent noise problems, keep the amplifier power leads away from the signal cords (RCA cords) and speaker leads. Also, keep the power leads away from any antenna cords.
- Before finalizing the installation, turn everything on, and make sure everything works correctly and listen for noise in the system.
- For detailed information on connections between different units and the amplifier, use the instruction manuals for the units. It is important to follow their recommendations precisely.

Connecting the special red battery lead

Use the special (red) battery lead supplied with the amplifier. This lead contains the appropriately rated fuse (30-amp fuse (x2)). This special (red) battery lead is made of heavy gauge wire so it is capable of carrying substantial amounts of current. Connect both of the two terminals at each end of the battery lead securely. Should any one terminal come loose, there may be a short circuit, perhaps causing electric shock or even a fire.

Route the special battery lead from the engine compartment through the firewall or vehicle body to the passenger compartment and connect it to the amplifier.

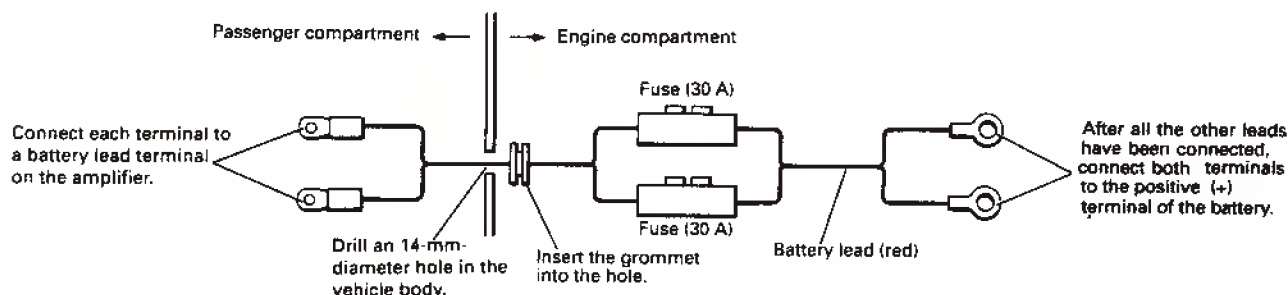
Drill an 14-mm diameter hole in the firewall or vehicle body and insert an O-ring rubber grommet and pull the battery lead through into the passenger compartment.

Note:

The O-ring rubber grommet is important because it protects the insulation on the battery lead from being worn away from normal vibrations and rubbing against sharp metal edges. Failure to install this grommet could result in a short circuit and fire.

While installing the wires, do not connect the positive (+) lead of the battery until the other leads have been connected. This will prevent accidental shorting to any other wiring or ground.

After making all other connections at the amplifier, connect the battery lead terminal of the amplifier to the positive (+) terminal of the battery.



After making all other connections at the amplifier, connect the battery lead terminal of the amplifier to the positive (+) terminal of the battery.

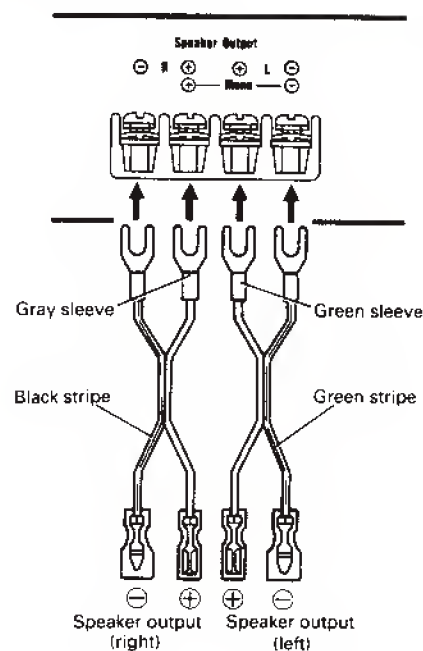
Connecting the leads (supplied)

Connecting the speaker leads

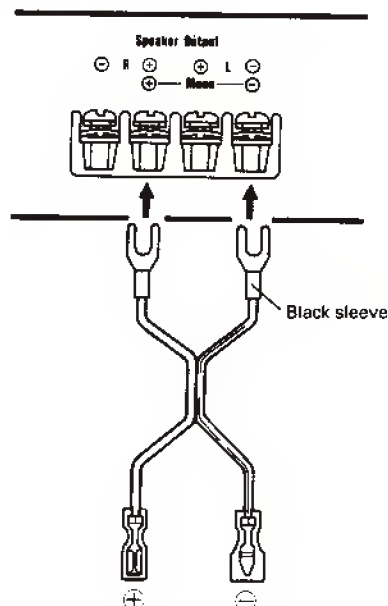
The speaker output mode can be two-channel (stereo), one-channel (mono), or three-channel (stereo + mono). Connect the speaker leads to suit the mode. To connect the speaker leads to the speaker terminals of the amplifier, see the connection diagram for each channel. Be careful with the polarity (+ and -), and with which channel is which (left [L] and right [R]).

- If the amplifier is used in three-channel mode, inductors and capacitors are needed. For more information, see "Three-channel mode (stereo + mono)".

Two-channel mode (stereo)



One-channel mode (mono)

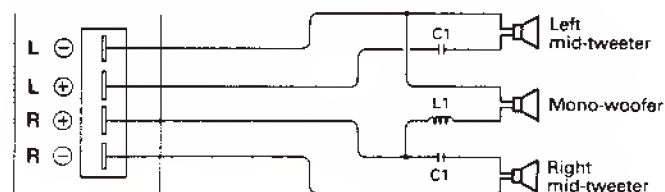


The following examples (1 and 2) require advanced understanding of electronics. If you do not understand the diagram, please have the work done by your nearest authorized Pioneer installation specialist.

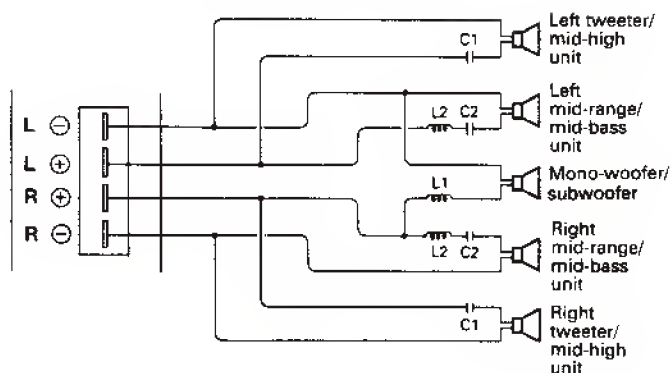
Three-channel mode (stereo + mono)

The power amplifier is basically a two-channel/one-channel bridgeable amplifier, but three channels can be achieved by combining the stereo and mono modes using inductors and capacitors. Some typical examples are given below.

Example 1 Three-channel, two-way system



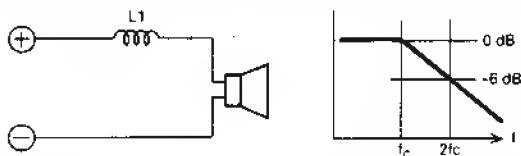
Example 2 Three-channel, three-way system



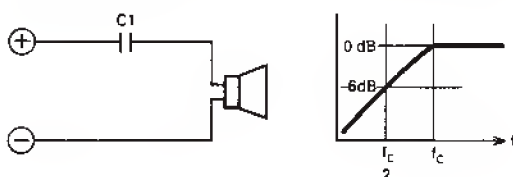
- The inductor (L1 or L2 in the diagram) acts as a low-pass filter. The capacitor (C1 or C2 in the diagram) acts as a high-pass filter.
- In the three-channel mode Pioneer recommends that an inductor (L) be used on the woofer/subwoofer, and that a capacitor (C) be used on the midrange/tweeter. Remember when bridging an amplifier it will see only half of the original speaker impedance. Therefore, you must use speakers that have ratings of 4 ohms or higher. If you use speakers that have lower impedance ratings it may cause damage to the amplifier.
- When the inductors and capacitors are connected to the speaker leads, secure or solder them so they cannot be pulled loose. Tape or use heat shrink on the joints to prevent short circuits.

Setting the filter constant

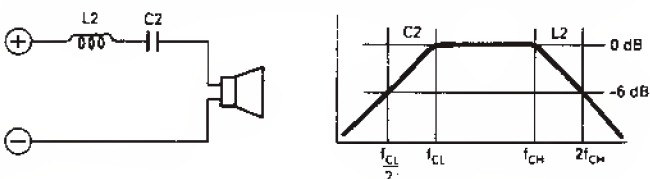
1 Low-pass filter (for subwoofer/woofer): 6 dB/octave



2 High-pass filter (for mid-tweeter/mid-high-tweeter): 6 dB/octave



3 Band-pass filter (combination of low-pass filter and high-pass filter for mid-bass/mid): 6 dB/octave



Component Guide

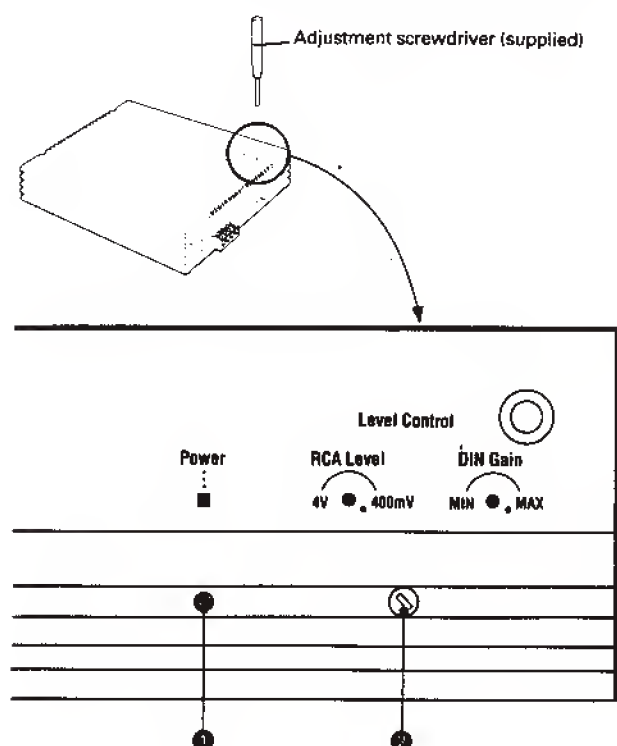
Speaker load impedance	2Ω		4Ω		8Ω	
	f _c (Hz)	L (mH)	C (μF)	L (mH)	C (μF)	L (mH)
	50	6.4	1600	12.7	800	25.5
	80	4.0	1000	8.0	500	16
	125	2.5	560	5.1	300	10
	200	1.6	400	3.2	200	6.4
	320	1.0	250	2.0	125	4
	500	0.64	160	1.3	80	2.6
	800	0.4	100	0.8	50	1.6
	1250	0.25	64	0.5	30	1.0
	2000	0.16	40	0.3	20	0.64
	3200	0.1	25	0.2	12.5	0.4
	5000	0.06	16	0.13	8	0.26
	8000	0.04	10	0.08	5	0.16
	10000	0.03	8	0.06	4	0.13

- A multi-channel system can be set up using a combination of filters 1, 2, and 3. The inductance (L) and capacitance (C) will determine the frequency (Hz) that the speaker will reproduce. Refer to the chart on the above to determine the components required.

WARNING

- Use the capacitors specified. Non-polarized capacitors rated at over ± 40 V should be used for C1 and C2 in the diagram. Because of the voltage output of the amplifier it is very important to use non-polarized capacitors rated at or over 40 V. This will prevent a safety hazard.

4. CONTROLS AND THEIR USE (EW MODEL)



① Power Indicator

The power indicator lights when the power is switched on.

② DIN input gain and RCA input level controls

The DIN input gain and RCA input level controls are used to adjust the DIN input gain and RCA input level, respectively. Set the input selector to suit the type of the car stereo component to be connected.

If this amplifier is connected to a Pioneer car stereo component with DIN sockets, set the DIN gain control to the specified position (+). If the amplifier is connected to a Pioneer car stereo component with RCA pin jacks, set the RCA level control to the specified position (+). If the amplifier is connected to a non-Pioneer car stereo component with RCA pin jacks, adjust the input level as shown in Fig. A.

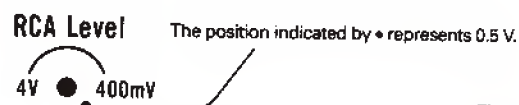
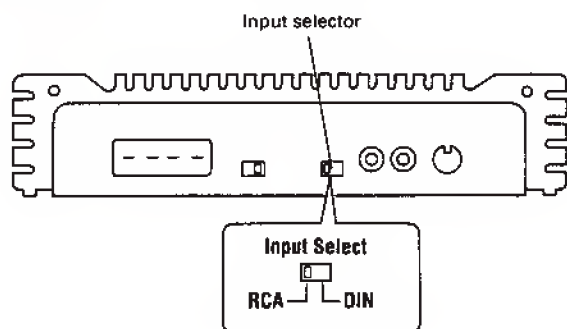


Fig. A

- Adjust control • with the supplied adjustment screwdriver. Keep the screwdriver in case you need to readjust the controls later.

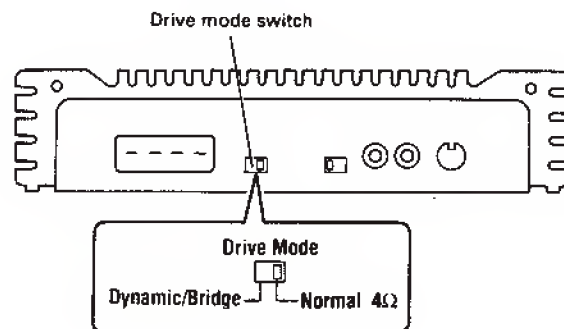
Input selector

Set the input selector to suit the car stereo component connected to the amplifier. To connect the amplifier to a car stereo component with RCA pin jacks, set the input selector to the left side (RCA position). To connect the amplifier to a Pioneer car stereo component with DIN sockets, set the input selector to the right side (DIN position).



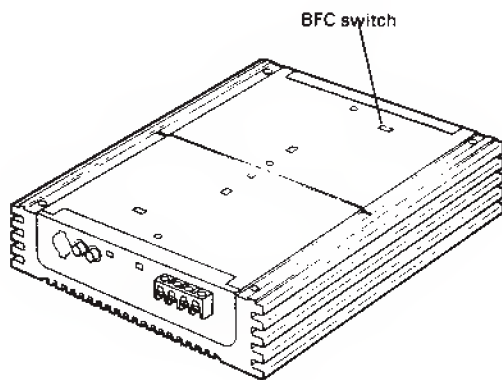
Drive mode switch

If the impedance of the speakers used with the amplifier is 4Ω or more, slide the drive mode switch on the rear of the amplifier to the right (Normal 4Ω). If one channel (mono) is used, or if the speaker impedance is 4Ω or less, slide the switch to the left (Dynamic/Bridge).



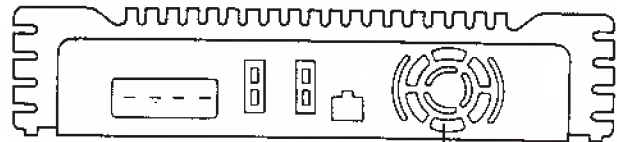
BFC (Beat Frequency Control) switch

If beating is heard when listening to AM stations on your car radio, change the position of the BFC switch on the bottom of the amplifier with a small flat-bladed screwdriver.

**Compulsory fan cooling system**

This is a high-power amplifier, so it produces a lot of heat. To keep it cool, it has fan cooling.

- When the power of the car stereo is turned on, the compulsory cooling fan of this power amplifier works automatically and cools inside of this amplifier.
- Install the amplifier so there is enough space front and back to allow the fan cooling to work properly. If the front or back side is covered, the amplifier may malfunction or fail.



5. CONNECTING THE UNITS (EW MODEL)

Connect the components as shown in the diagram.

- Before finalizing installation, turn everything on, and make sure everything works correctly and that no noise is getting into the system.
- When routing leads and cords, secure them with cable retainers and electrician's adhesive tape. Also, to prevent any damage to the insulation on the leads and cords, protect them with electrician's adhesive tape wherever they may touch sharp edges.
- Keep all wiring away from hot surfaces or heater outlets to prevent short circuits.
- It is recommended that the speakers connected to the amplifier have the ratings shown below, or higher. If a speaker has a rating below that recommended, it may be damaged when the volume is turned up. The speaker impedance must be 2 to 8 ohms.

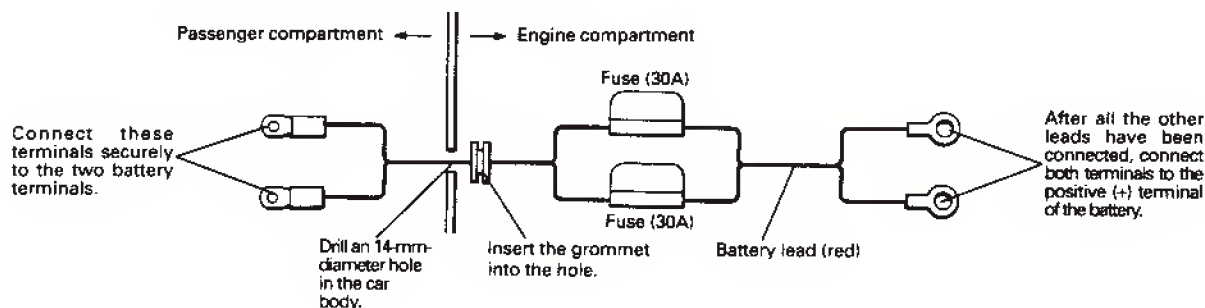
Mode	Speaker ratings	
Two-channel	Maximum	240 W
	Nominal	120 W
One-channel	Maximum	640 W
	Nominal	320 W

In the case of a full-range speaker, use one whose maximum rating is higher than the maximum rating shown. In the case of a sub-woofer, use one whose nominal rating is higher than the nominal rating shown.

- Never connect a speaker lead to ground or to other speaker grounds. The protection circuitry will operate instantaneously, turning off the amplifier.
- To prevent noise problems, keep the power leads to the amplifier away from the signal cords and speaker leads. Also, keep the power leads away from any antenna cords.
- Amplifier ground leads (black) should be connected to a solid metal part of the vehicle body. If using multiple amplifiers, connect all amplifier ground leads to the same point to prevent noise problems. To get good contact when grounding, you may have to sand away the paint to expose the metal underneath.
- To operate the amplifier and car stereo properly, connect the battery lead and the accessory power lead (red/black) correctly. If the leads are not connected correctly or are not connected at all, the amplifier and car stereo will not work.
- To connect the amplifier to the RCA pin jacks of a car stereo component, use an audio cord with RCA pin plugs. To connect the amplifier to the DIN socket of a car stereo component, use a DIN connection cord. Both kinds of cord are available from your dealer.

Connecting the battery lead (red)

Route the positive(+) battery lead (red) from the engine compartment to the passenger compartment before connecting it to the amplifier. To prevent a short circuit, only connect the lead after connecting all the other leads. Connect the two wires of the battery lead securely. If either of them comes loose because of vibration while the car is moving, a short circuit may occur and a fire may break out.

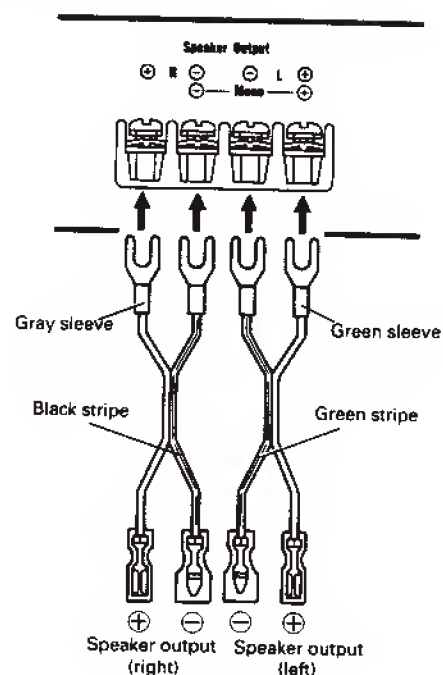


Connecting the leads (supplied)

Connecting the speaker leads

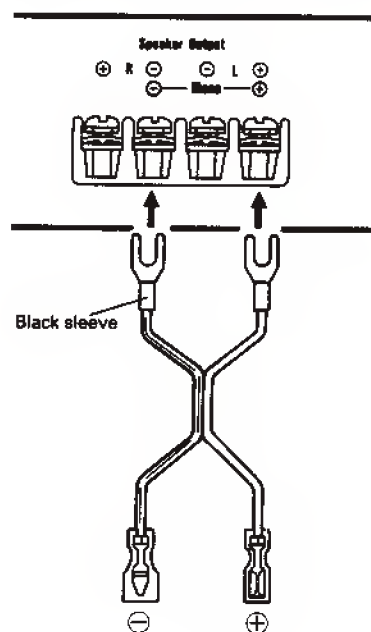
This amplifier can select two-channel output (stereo) or one-channel output (mono). The speaker leads must be connected to suit the mode selected. Connect the speaker leads to the output terminals of the amplifier, paying attention to the polarities (+ and -) and lead colors.

Two-channel mode (stereo)



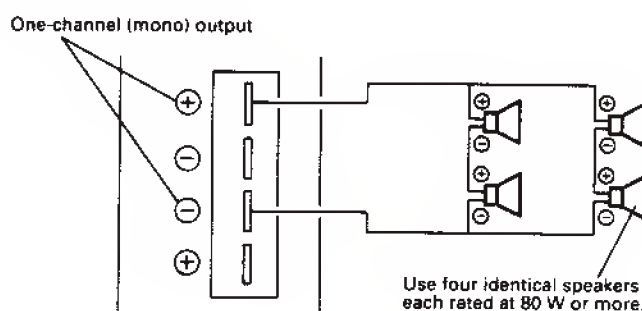
One-channel mode (mono)

- Slide the drive mode switch to the left (Dynamic/Bridge).



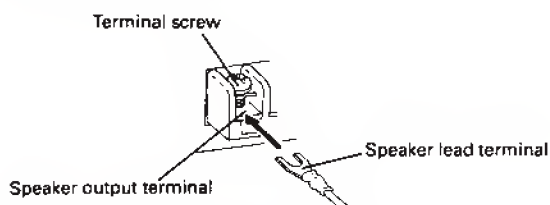
Speakers to be connected to the amplifier for one channel (mono)

If this amplifier is used for one channel (mono), its nominal output is 320 W (640 W max.). To handle this output, four identical speakers with nominal inputs of 80 W or more should be connected as shown below (making the total nominal inputs 320 W or more). The output volume will be greater than when only a single speaker is used.

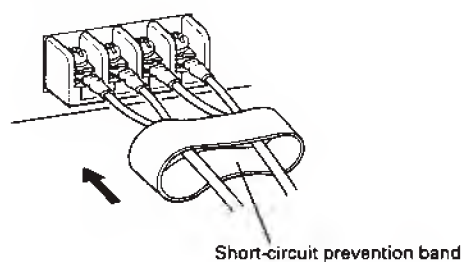


Speaker lead connection procedure

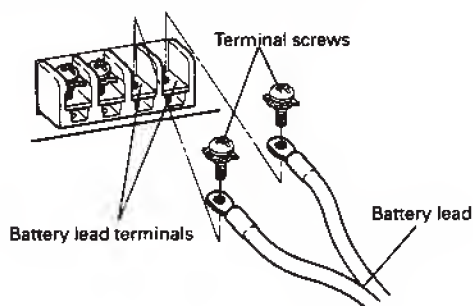
1. Loosen the four screws of the speaker terminals (Speaker Output) on the rear of the amplifier.
2. Insert the end of each speaker lead between the speaker terminal and its screw according to the mode to be used, and tighten the screw.



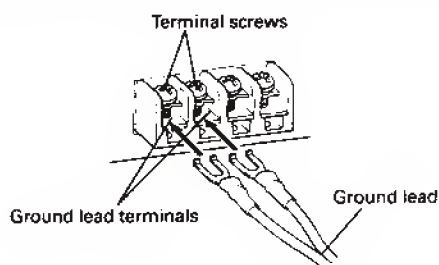
3. Cover each terminal block with a short-circuit prevention band.
 - This band *must* be used.



3. Connect the battery lead to the two battery lead terminals, reinserting and tightening the screws (× 2).

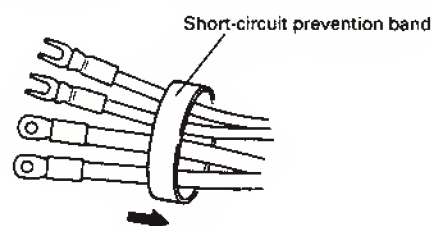


4. Connect the ground lead to the two ground lead terminals, tightening the screws.

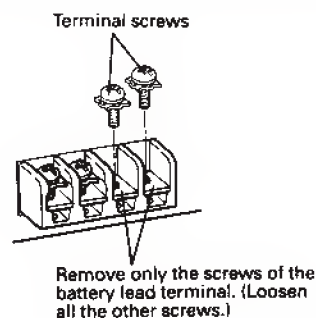


Connection of the battery power, and ground leads

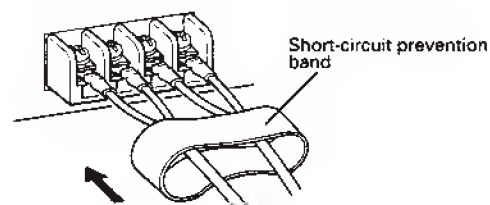
1. Pass the leads through the band for preventing short circuits.
 - This band *must* be used.



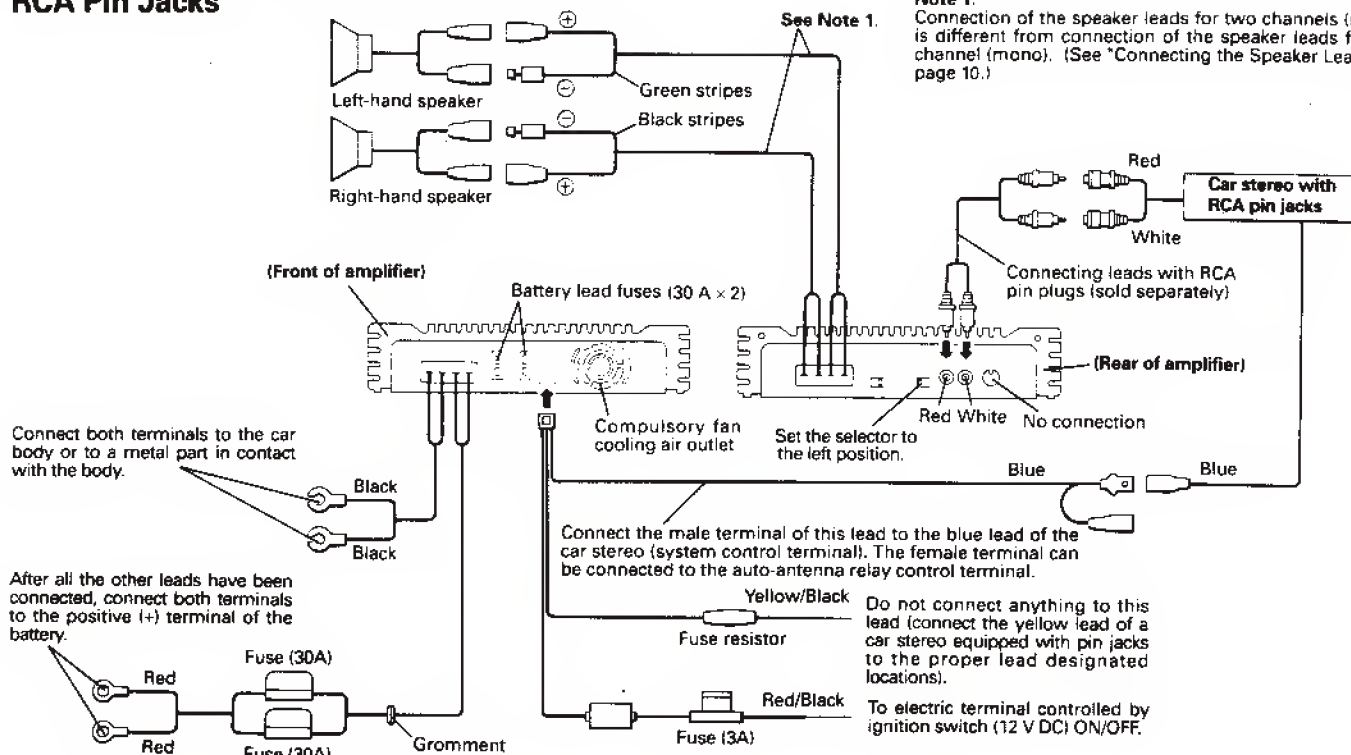
2. Loosen the screws (× 2) of the terminals on the front panel of the amplifier.
 - Remove the screws (× 2) from the two battery power terminals.



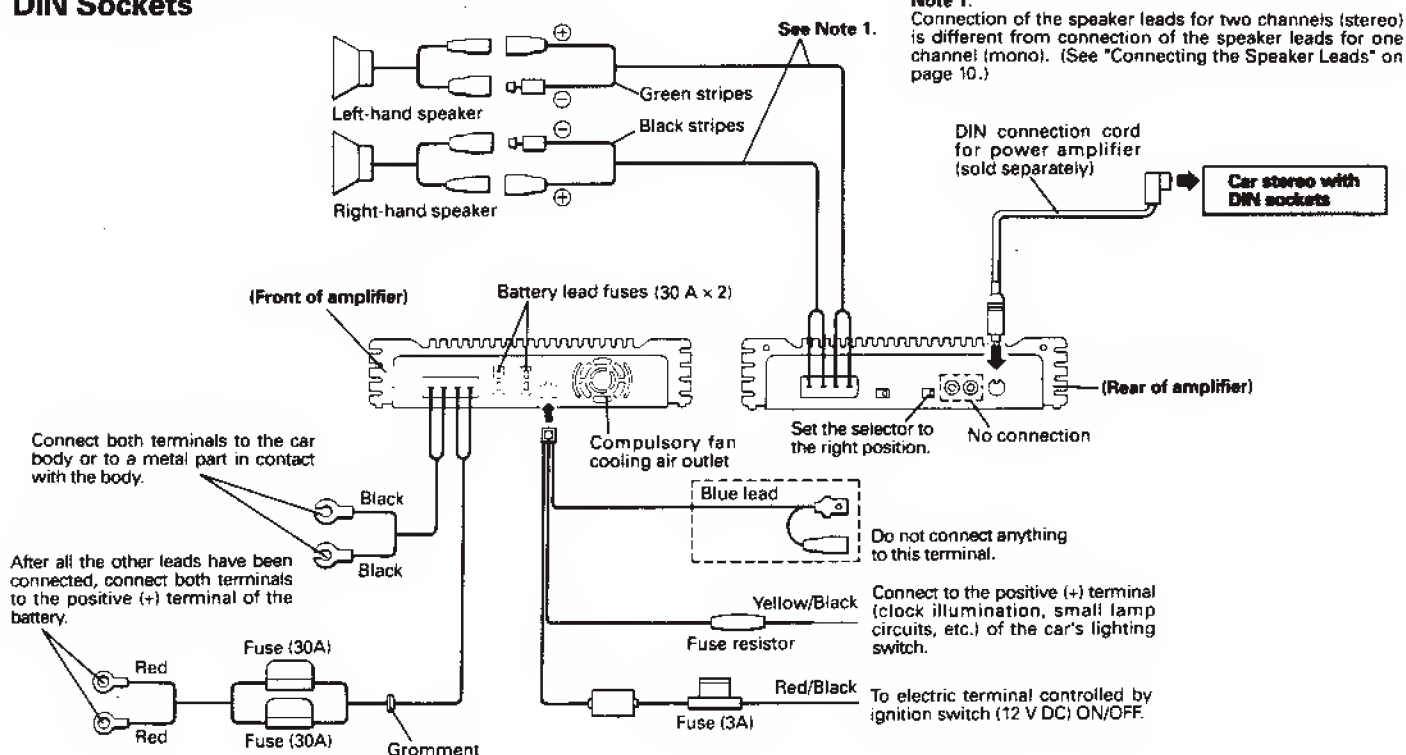
5. Slide the short-circuit prevention band over the terminals.



When Combined with a Car Stereo with RCA Pin Jacks



When Combined with a Car Stereo with DIN Sockets



6. DISASSEMBLY

● Remove the Case

1. Remove the four screws A and remove the two cases.

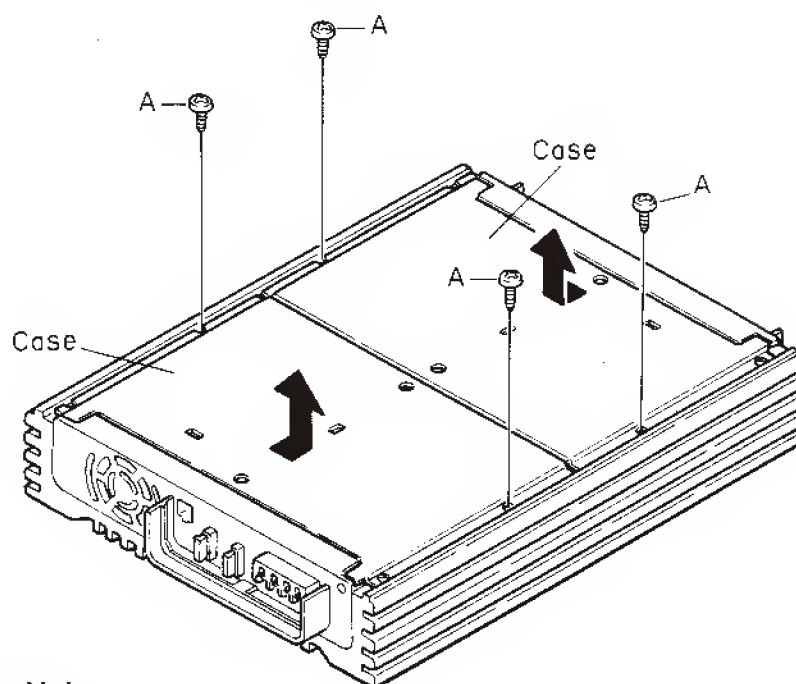


Fig. 1

● Remove the Amp Unit

1. Remove the two screws B and remove the front panel.
2. Remove the two screws C and remove the rear panel.
3. Remove the four screws D and thirteen screws E.
4. Remove the Amp Unit.

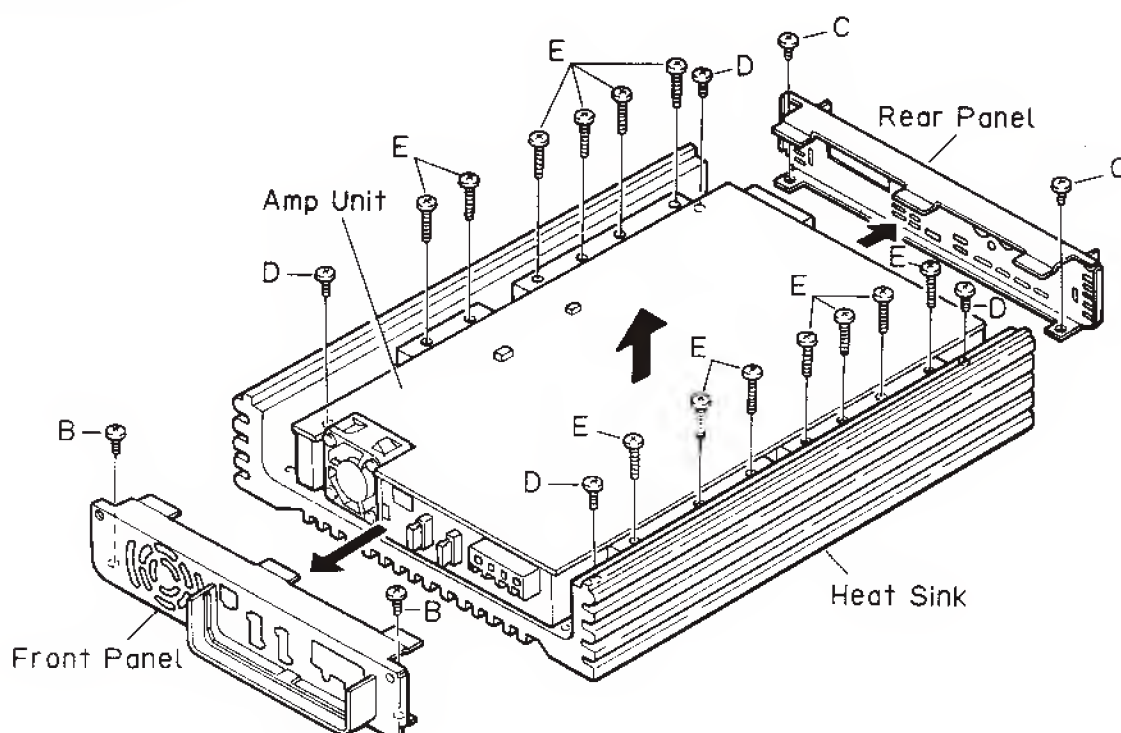


Fig. 2

● **Remove the Bracket**

1. Remove the screw F and remove the LED Assy.
2. Remove the three screws G and remove the bracket.

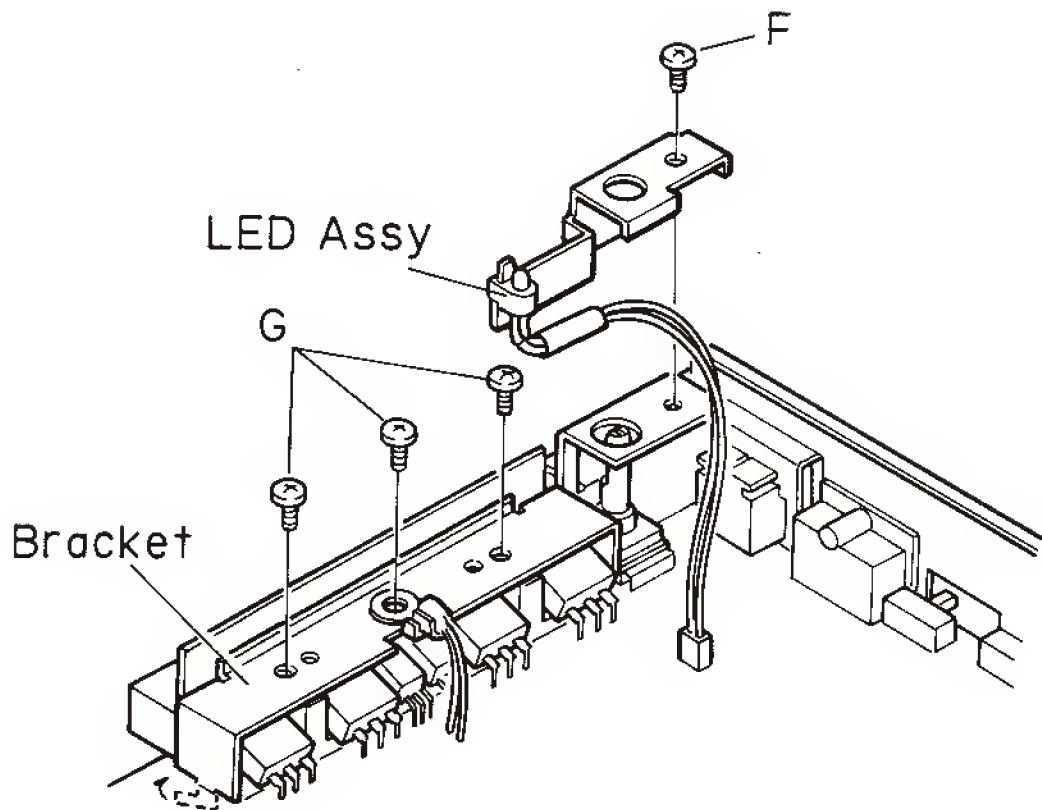


Fig. 3

Attention points for disassembling

- The screw of ground terminal cannot be removed. Don't loosen forcibly.
- After removing the amplifier unit, put the amplifier unit on the heat sink being faced down. When the amplifier unit on the audio circuit side (The side fixed by four screws) is fixed using the screw, the test at full power can be done for approx. 20 minutes.

7. CIRCUIT DESCRIPTION

- **Isolator circuit**

The differential amplification circuit, which is usually combined with the operational amplifier and the resistance network, is arranged to the dedicated IC. The ripple removal ratio is further improved than the conventional differential amplification circuit.

- **Non-switching circuit type III**

By adding Q429 to Q432, distortion removal capacity is improved.

- **PWM POWER SUPPLY (Voltage detection circuit for both positive and negative voltage.)**

The PWM power supply is a circuit that maintains stable secondary voltage in a DC-DC converter, regardless of the voltage fluctuation and load fluctuation of the primary voltage.

Former PWM power supply detected and controlled only positive voltage of DC-DC converter. New PWM power supply increases output in the lower range through detecting and controlling both positive and negative voltages and it creates a higher fidelity sound.

(Manufacture the current mirror using Q114 and Q115, and input $-V_H$ into the pin 16 of IC101 through Q116. $+V_H$ is input through Q117. R131 to R134 are the voltage dividers.)

- **Troidal transformer and others**

To improve efficiency and to delete the leakage flux, the "doughnut" type transformer is adopted. And corresponding to current increment, two fuse, choke coil parallel combinations. (L101, L102)

- **DC servo**

To reduce the DC component appeared in the output, DC is fed back by means of IC201 and IC202. This circuit performs the low-pass feed back of less than 200Hz simultaneously.

- **In this unit, the mode selecting circuit was simplified in the following manners.**

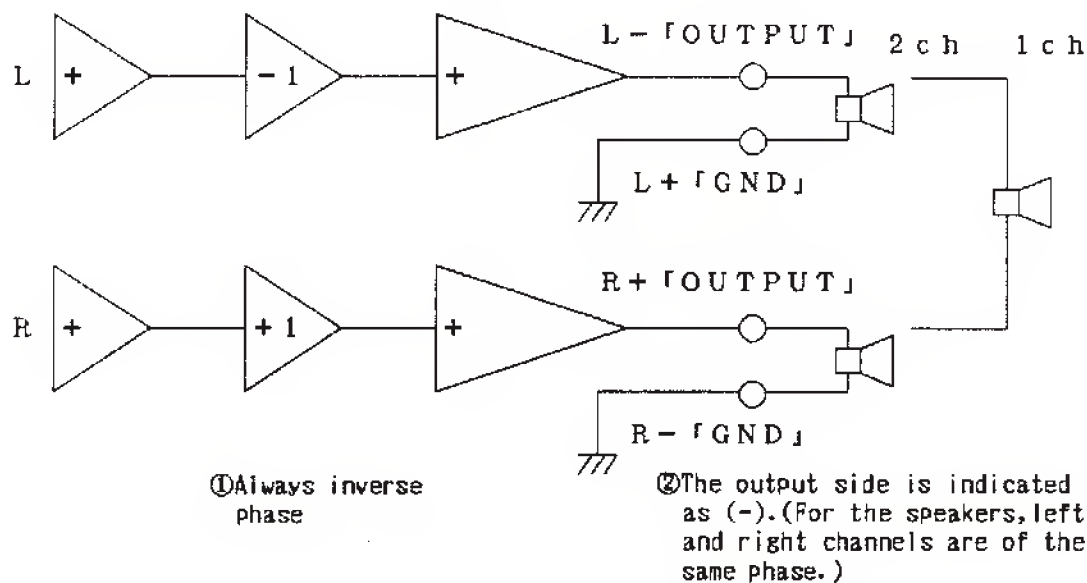


Fig. 4

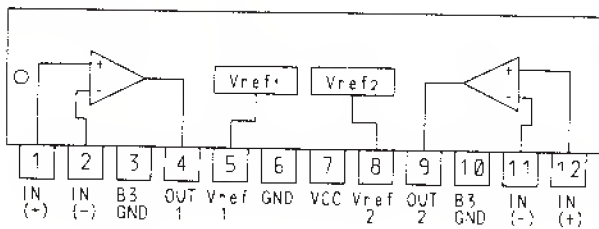
Figure shows the case of UC, EW carries out ① and ② on the right channel.

For the above two reasons, a signal selector switch was eliminated.

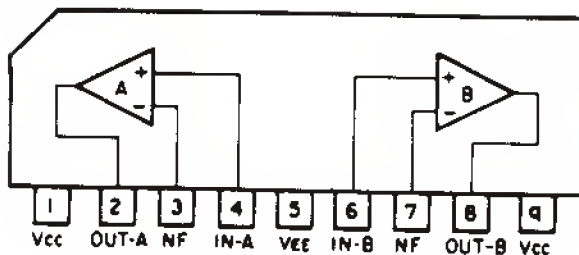
When you make a test, take care not to short-circuit (OUTPUT) and (GND). Especially when you measure two channels at the same time, a great care must be taken because short-circuit is susceptible to take place at the measuring instrument.

• ICs

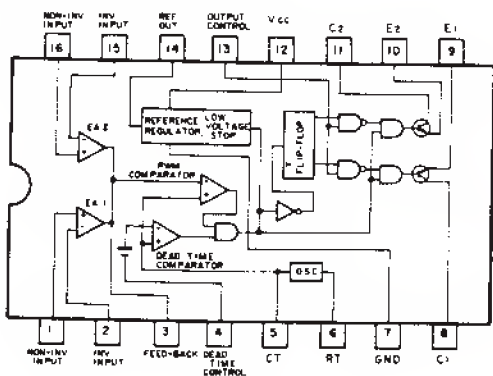
TA8181SN



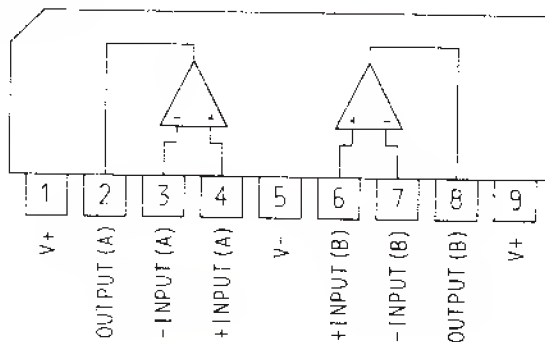
NJM2068S



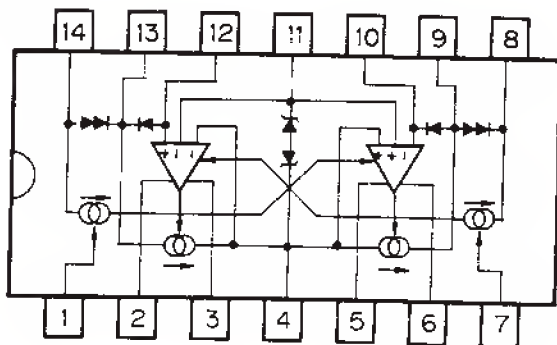
UPC494C



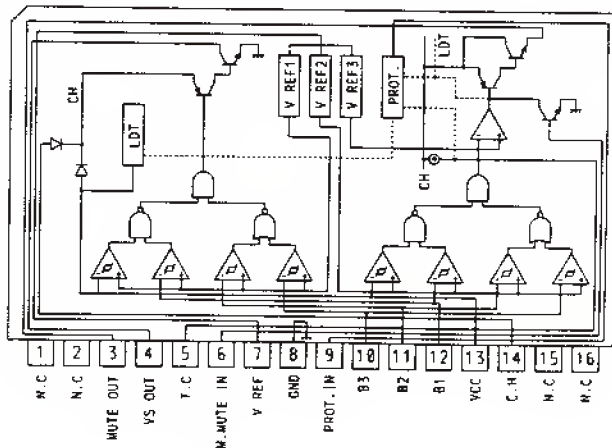
NJM5532S



PA0016



TA8194Z



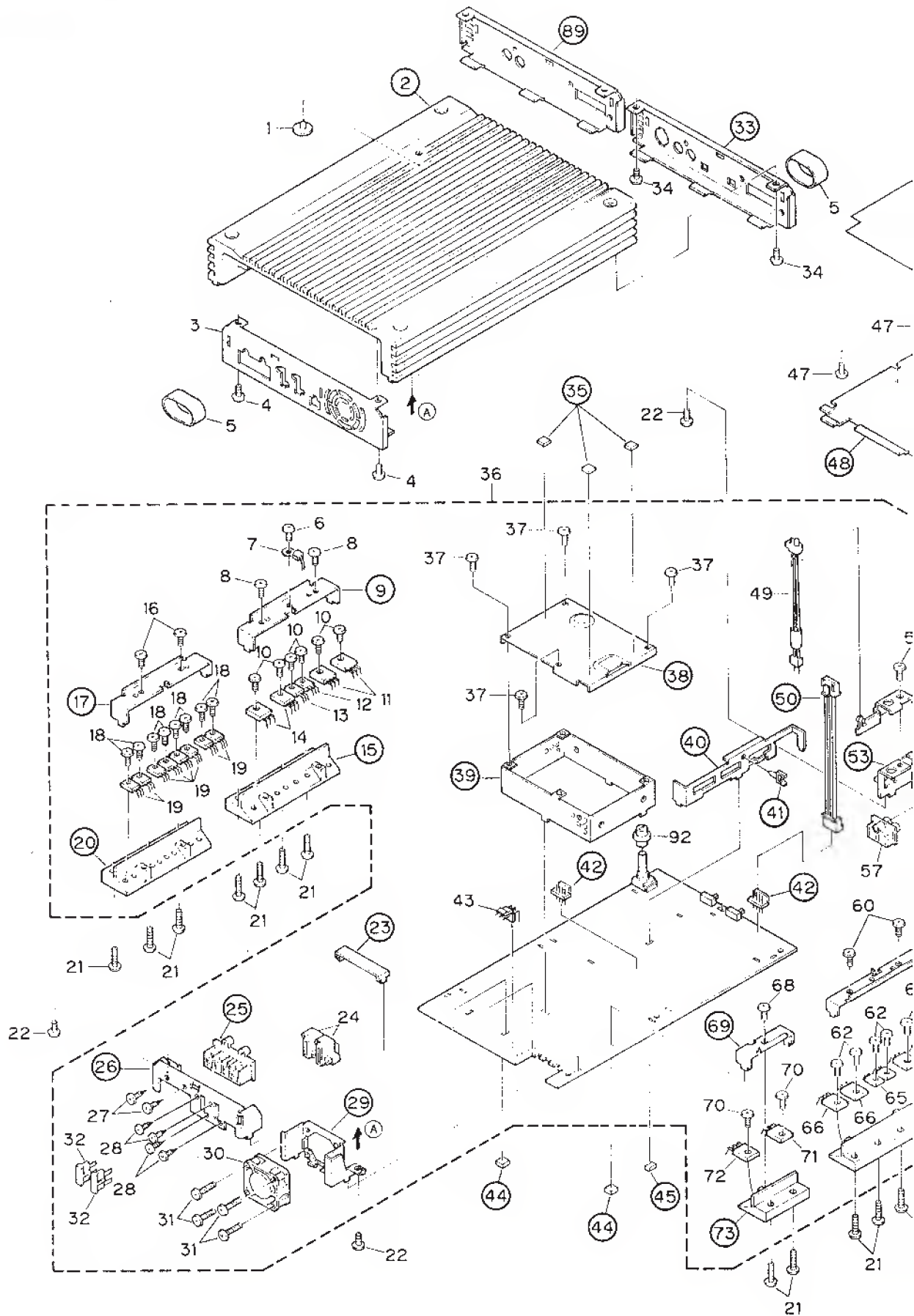
12. EXPLODED VIEW

A

B

C

D



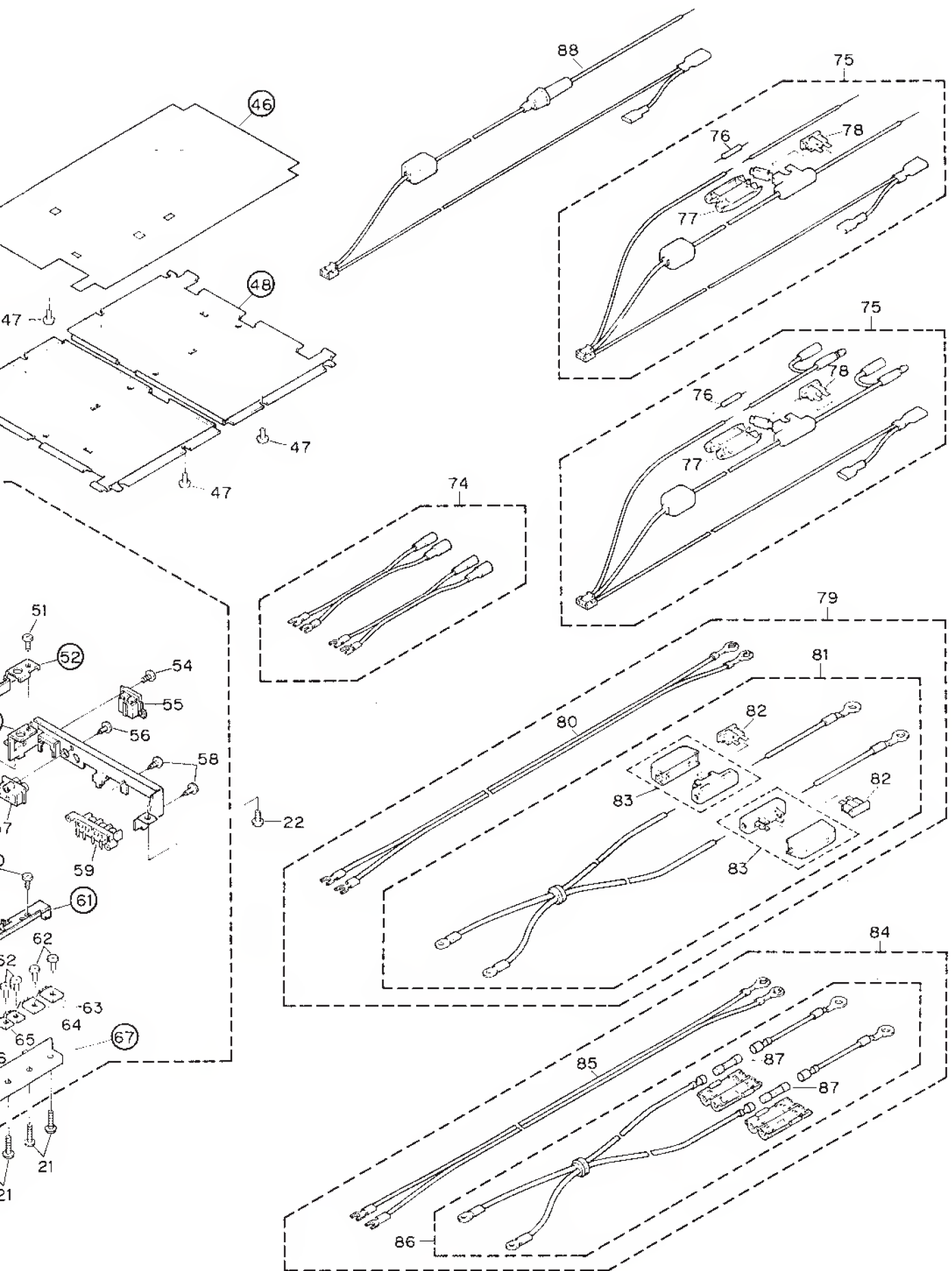


Fig. 9

● Parts List

NOTE:

- The parts marked with "●" may need long time to supply and their supply is subject to refuse as the case may be.
- Because the parts with encircled number shown on the dismantling drawing are not spare parts, we are unable to supply them in principle.

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Lens	CNS2050	48	Case	CNB1470
2	Heat Sink (UC)	CNR1186	49	110 Assy	CXA21R3
	Heat Sink (EW)	CNR1205	50	Cord	CDE1276
3	Panel (UC)	CNB1421	51	Screw	BMZ30P050FMC
	Panel (EW)	CNB1452	52	Holder	CNC3539
4	Screw	BMZ30P050FMC	53	Bracket	CNC3538
5	Cover	CNS2211	54	Screw (EW)	BMZ20P080FMC
6	Screw	BMZ30P050FMC	55	Connector (EW)	CXS1156
7	Thermister	CCX1017	56	Screw	PPZ30P100F2K
8	Screw	BMZ30P050FMC	57	Jack	CXB1006
9	Bracket	CNC3540	58	Screw	PPZ30P100F2K
10	Screw	BMZ30P080FMC	59	Terminal	CXE1018
11	Transistor	2SA1673	60	Screw	BMZ30P050FMC
12	Transistor	2SA1306	61	Bracket	CNC3540
13	Transistor	2SC3298	62	Screw	BMZ30P080FMC
14	Transistor	2SC4388	63	Transistor	2SC4388
15	Heat Sink	CNR1207	64	Transistor	2SC3298
16	Screw	BMZ30P050FMC	65	Transistor	2SA1306
17	Bracket	CNC3540	66	Transistor	2SA1673
18	Screw	BMZ30P080FMC	67	Heat Sink	CNR1207
19	FET	2SX1191	68	Screw	BMZ30P050FMC
20	Heat Sink	CNR1208	69	Bracket	CNC3541
21	Screw	BMZ30P180FMC	70	Screw	BMZ30P080FMC
22	Screw	BMZ30P050FMC	71	Diode	FM6-32R
23	Terminal	CNC3641	72	Diode	1MG 32S
24	Auto Fuse Holder	CKR1004	73	Heat Sink	CNR1209
25	Terminal	CXE1020	74	Cord Assy	CDE3019
26	Bracket	CNC3537	75	Cord Assy (EW)	CDE3308
27	Screw	PPZ30P100F2K	76	Resistor (EW)	RS1/2P102JL
28	Screw	PPZ20P080F2K	77	Cap (EW)	CNS1472
29	Bracket	CNC3536	78	Fuse (EW)	CEK1134
30	Motor Fan	CKM1047	79	Cord Assy (EW)	CDE3297
31	Screw	BMZ30P250FMC	80	Cord (EW)	CDE3069
32	Fuse	CEK1140	81	Cord (EW)	CDE3299
33	Panel (EW)	CNB1473	82	Fuse (EW)	CEK1140
34	Screw	BMZ30P050FMC	83	Auto Fuse Holder (EW)	CKR1006
35	Spacer	CNM3142	84	Cord Assy (UC)	CDE3298
36	Amp Unit (UC)	CNM7782	85	Cord (UC)	CDE3069
37	Amp Unit (EW)	CNM2781	86	Cord (UC)	CDE3068
		BMZ30P050FMC	87	Fuse (UC)	CEK1117
38	Shield Case	CNC3540	88	Cord Assy (UC)	CDE3309
39	Shield Case	CNC3547	89	Panel (UC)	CNB1422
40	Holder	CNC3543	90, 91	
41	Clamper	CNV1343	92	Knob	CAA1275
42	Plug	CXS-557			
43	Plug	CKS1821			
44	Spacer	CNM3075			
45	Spacer	CNM3141			
46	Insulator	CNM3140			
47	Screw	BMZ30P060FMC			

13. PACKING METHOD

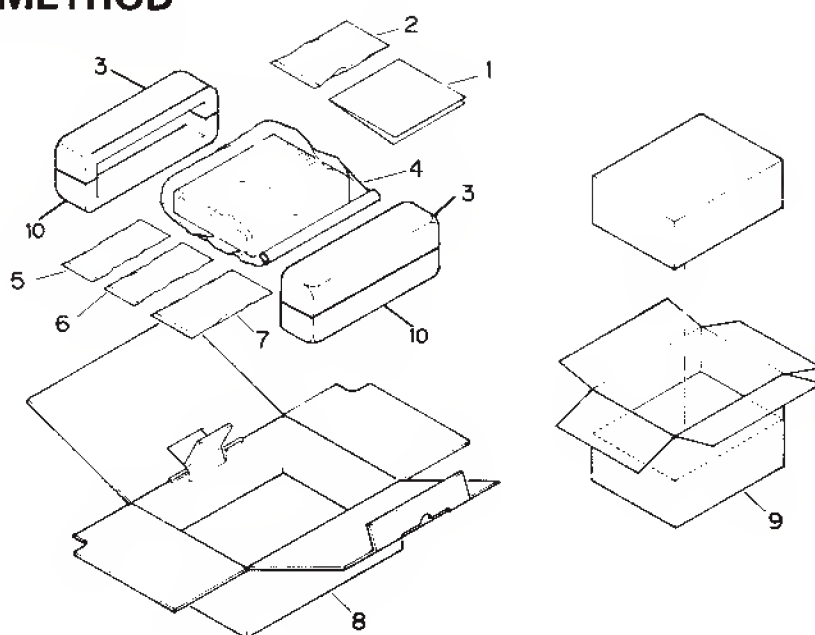


Fig. 10

• Parts List

NSP: Non Spare Part

Mark No.	Description	GM-H200/UC	GM-4200/EW
		Part No.	Part No.
1-1	Owner's Manual	CRD1457	CRD1455
	Owner's Manual	CRD1456
1-2	Card	NSP
	Card	NSP
2	Accessory Assy	CEA1654	CEA1654
2-1	Screw Assy	NSP	NSP
2-1-1	Screw (×4)	HYC50P65DFZK	HYC50P650FZK
2-2	Cover (×2)	CNS2211	CNS2211
2-3	Driver	CNV2697	CNV2697
3	Styrofoam	CHP1421	CHP1421
4	Cover	CEG1100	CEG1100
5	Cord Assy	CDE3309	CDE3308
6	Cord Assy	CDE3019	CDE3019
7	Cord Assy	CDE3298	CDE3297
7-1	Cord	CDE3069	CDE3069
7-2	Cord	CDE3068	CDE3299
8	Carton	CHG2003	CHG2002
9	Contain Box	CHL2003
10	Styrofoam	CHP1422	CHP1422

* Owner's Manual

Part No.	Model	Language
CRD1457	UC	English, French
CRD1455	EW	English, French, German, Spanish
CRD1456	EW	Swedish, Norwegian, Dutch, Italian, Finnish

14. ELECTRICAL PARTS LIST

NOTE:

- Parts whose parts numbers are omitted are subject to being not supplied.

• GM-H200/UC

Unit Number :
Unit Name : Amp Unit

MISCELLANEOUS

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
IC	1			TAB181SN	
IC	3			WJM7068S	
IC	101			UPC484C	
IC	201 202			NJM5532S	
IC	501 502			PA0016	
IC	601			TA81947	
Q	101 102 103 104 105 106 107 108			2SK1191	
Q	109 110			2SC3422	
Q	111 112			2SA1358	
Q	114 115 603			2SA1048	
Q	116 117 604 605			2SC2458	
Q	151 608			2SD2037	
Q	152			2SB1357	
Q	153			2SC3422	
Q	154			2SA1358	
Q	301 302			2SD1768S	
Q	303			2SB1278	
Q	401			2SK389	
Q	402			2SK388	
Q	405 406 407 408			2SC2603	
Q	409 410 411 412 413 414 415 416			2SC1845	
Q	417 418 421 422 427 428 429 430 503 504			2SA1145	
Q	419 420			2SA997	
Q	423 424 425 426 431 432 501 502			2SC2705	
Q	505 506			2SC3298	
Q	507 508			2SA1306	
Q	509 510 513 514			2SC4388	
Q	511 512 515 516			2SA1673	
Q	601			2SB1240	
Q	602			2SC3113	
Q	609 610			2SC2787	
Q	611			2SA1048	
D	1			H7S13JB3	
D	101 102			RM47	
D	103 303 602			ERA15-D2VM	
D	105			73CP	
D	106 107			ISS133	
D	151			FMC-32S	
D	152			FMC-32R	
D	153 154			H7S16JB1	
D	155 156			RD3R3ESB2	
D	301 302 405 406 407 408 409 410 411 412			ISS133	
D	401 402			RD7R5JSB1	
D	403 404			H7S6B1L	
D	413 414 415 416 417 418 419 420 425 426			ISS133	

Mark ===== Circuit Symbol & No. ===== Part Name Part No.

D	421 422 423 424			RD8R2JSB1
D	427 428 429 430 431 432 604			ISS133
D	501 502 503 504			ISS177
D	601			RD6R8JSB2
D	603			H7S9R1JB1
D	605			H7S12JB2
D	606			CXA2183
L	1 2		LED Assy	CTF1007
L	101 102		Ferrite Inductor	CTH1086
L	104		Coil	CTF-113
L	151 152		Coil 100μH	
L	501 502		Choke Coil	CTH1027
L	501 502		Coil	CTH1088
T	1		Transformer	CTT1014
RY	301		Relay	CSR1015
TH	301		Thermistor	GCK1012
M	601		Motor Fan	CXM1047
SW	3		Switch (BFC)	HSW-156
VR	1		Volume 5KΩ (A)	CCS1183
FU	1 2		Fuse 30A	CEX1140
EF	151		EMI Filter	CCG1020

RESISTORS

Mark	=====	Circuit Symbol & No.	=====	Part Name	Part No.						
R	1	2			RD1/4PS201JL						
R	3	4			RD1/4PS682JL						
R	5	6			RD1/4PS391JL						
R	31	38			RD1/4PS102JL						
R	33				RD1/4PS242JL						
R	34				RD1/4PS152JL						
R	36				RD1/4PS102JL						
R	39	40			RD1/4PS471JL						
R	41	42			RD1/4PS470JL						
R	101	102	103	104	RS1/2P330JL						
R	105	106	107	108	109	110	111	112	469	470	RD1/4PS680JL
R	113	114	127	128							RD1/4PS182JL
R	115	116									RD1/4PS332JL
R	117										RN1/4PC1502D
R	118										RD1/4PS105JL
R	119										RD1/4PS102JL
R	120										RD1/4PS512JL
R	121	124	125	603	610						RD1/4PS472JL
R	127	445	446	447	448	465	466	467	468		RD1/4PS432JL
R	126	129									RD1/4PS153JL
R	130										RD1/4PS223JL
R	131										RD1/4PS184JL
R	132	403	404								RD1/4PS224JL

Mark	=====	Circuit Symbol & No.	====	Part Name	Part No.	Mark	=====	Circuit Symbol & No.	====	Part Name	Part No.					
R		133			RD1/4PS363JL	C		15	16		CKPYB102K50L					
R		134	231	232	409	410					CFTNA104J50					
R		151	152			RD1/4PS822JL	C		33		CKPYB391K50L					
R		153	154			RD1/4PS182JL	C		34		CKPYB471K50L					
R		155	156	475	476	477	478				CEA101M10L2					
						RD1/4PS352JL	C		35	36						
R		201	202	203	204											
R		205	206													
R		207	208													
R		209	210	235	236											
R		211	212	237	238											
						RN1/4PC2202D	C	101	102	103	104	3900 μ F/16V		CCH1094		
						RN1/4PC1002D	C	105	106					CQMA153J50		
						RN1/4PC1002D	C	107						COPA102G2A		
						RN1/4PC1802D	C	108						CEA2R2M50L2		
						RN1/4PC1803D	C	109				470 μ F/16V		CCH-114		
R		233	234													
R		239	243													
R		301	302	307	308											
R		303	304	433	434	435	436	607	608							
R		305														
						RN1/4PC9101D	C	110				470 μ F/16V		CCH-114		
						RD1/4PS471JL	C	111	112					CQMA104J50		
						RD1/4PS104JL	C	113	601	603		470 μ F/16V		CCH-114		
						RD1/4PS473JL	C	151	152			6800 μ F/63V		CCH1091		
						RD1/4PS471JL	C	153	154			1000 μ F/63V		CCH1090		
R		306	613													
R		401	432	602												
R		405	406	407	408											
R		411	412	437	438	439	440									
R		413	414	423	424	425	426									
						RD1/4PS222JL	C	155	156	157	158			CEHA0470M50		
						RD1/4PS221JL	C	159	160					CEA101M16L2		
						RD1/4PS682JL	C	211	212	219	220			COPA102G2A		
						RD1/4PS181JL	C	213	214					CEA100M16WPLL		
						RD1/4PS332JL	C	215	216	405	406	411	412	CQMA103J50		
R		415	416													
R		417	418	419	420	429	430	431	432	605						
R		421	422	521	522	533	534	535	536	537	538					
R		427	428													
R		441	442	443	444	501	502	503	504	513	514					
						RD1/4PS681JL	C	217	218					CCCC390J50		
						RD1/4PS331JL	C	301	302	517	518			CQMA102J50		
						RD1/4PS470JL	C	401	402					CKPYB271K50L		
						RD1/4PS122JL	C	403	404					CQMA122J50		
						RD1/4PS103JL	C	407	408					CEA271M50L2		
R		449	450	451	452	485	486	487	488							
R		453	454	455	456											
R		457	458	459	460											
R		461	462	463	464											
R		471	472													
						RD1/4PS562JL	C	409	410					CQMA561J50		
						RD1/4PS152JL	C	413	414	415	416			CMA121J2H		
						RD1/4PS821JL	C	417	418	419	420			CQMA102J50		
						RD1/4PS820JL	C	421	422	423	424			CCPS1680J50L		
						RD1/4PS680JL	C	425	426					CCPS1470J50L		
R		505	506	507	508	517	518	519	520	604	617					
R		509	510													
R		515	516													
R		523	524													
R		525	526	527	528	529	530	531	532							
						RD1/4PS103JL	C	427	428	429	430			CEA101M25L2		
						RD1/4PS561JL	C	431	432	433	434	519	520	521	522	CFTNA104J50
						RD1/4PS101JL	C	501	502	503	504					CMA470J2H
						RD1/4PS560JL	C	505	506	507	508					CMA101J2H
						RD1/4PS4R7JL	C	509	510	511	512					CQMA104J50
R		539	540													
R		541	542	543	544	0.33Ω × 2										
R		545	546													
R		547	548													
R		601	619													
						RD1/4PS470JL	C	513	514	515	516	1000 μ F/40V				CCH1096
						CCM1041	C	602								CEA220M16L2
						RS2P101JL	C	604				220 μ F/10V				CCH1036
						RS2P100JL	C	605								CEA101M16L2
						RD1/4PS751JL	C	606								CEA4R7M50L2
R		606														
R		609														
R		611														
R		612														
R		620														
						RD1/4PS123JL										
						RD1/4PS104JL										
						RD1/4PS822JL										
						RS1/2P561JL										
						RD1/4PS473JL										
R		621	622													
R		623														
R		625														
						RD1/4PS107JL										
						RD1/4PS182JL										
						RD1/4PS331JL										

CAPACITORS

Mark	=====	Circuit Symbol & No.	=====	Part Name	Part No.
C	1	2			CEA3R3M50L2
C	3	4			CEA470M16L2
C	5	6	11	12	CEA330M16L2
C	7				CEA470M16L2
C	13	14			CQMA163J50

GM-4200/EW

Unit Number :
Unit Name : Amp Unit

MISCELLANEOUS

Mark	=====	Circuit Symbol & No.	=====	Part Name	Part No.					
IC		1			TA8161SN					
IC		2	3		NJM206BS					
IC		101			UPC494C					
IC		201	202		NJM5532S					
IC		501	502		PA0016					
IC		601			TA8194Z					
Q		101	102	103	104	105	106	107	108	2SK1191
Q		109	110							2SC3422
Q		111	112							2SA1355
Q		113	116	117	604	605	606			2SC2458

Mark ===== Circuit Symbol & No. ---- Part Name Part No.

RES STORS

Mark ===== Circuit Symbol & No. ---- Part Name Part No.

Q 114 115 116 607 2SA1048
 Q 151 608 2SD2337
 Q 152 2SB1357
 Q 153 2SC3422
 Q 154 2SA1359

R 2 2 RD1/4PS472JL
 R 3 4 RD1/4PS382JL
 R 5 6 RD1/4PS391JL
 R 21 22 RD1/4PS471JL
 R 23 24 RD1/4PS223JL

Q 301 302 2SD17685
 Q 303 2SB1278
 Q 401 2SK389
 Q 402 2SK389
 Q 405 406 407 408 2SC2602

R 25 26 27 28 RD1/4PS102JL
 R 32 RD1/4PS102JL
 R 33 RD1/4PS152JL
 R 34 RD1/4PS242JL
 R 35 RD1/4PS102JL

Q 409 410 411 412 413 414 415 416 2SC1845
 Q 417 418 421 422 427 428 429 430 503 504 2SA1145
 Q 419 420 2SA997
 Q 423 424 425 426 431 432 501 502 2SC2705
 Q 505 506 2SC3298

R 37 RD1/4PS102JL
 R 39 40 RD1/4PS471JL
 R 41 42 RD1/4PS470JL
 R 101 102 103 104 RS1/2P333JL
 R 105 106 107 108 109 110 111 112 469 470 RD1/4PS680JL

Q 507 508 2SA1366
 Q 509 510 513 514 2SC4388
 Q 511 512 515 516 2SA1673
 Q 601 2SB1240
 Q 602 2SC3113

R 113 114 127 128 RD1/4PS182JL
 R 115 116 RD1/4PS332JL
 R 117 RN1/4PC1502D
 R 118 RD1/4PS105JL
 R 119 153 154 615 RU1/4PS192JL

Q 609 610 2SC2787
 Q 611 2SA1048
 D 1 HZS13JB3
 D 101 102 HM4Z
 D 103 303 602 ERA15-02VH

R 120 RD1/4PS512JL
 R 121 124 125 603 610 RD1/4PS472JL
 R 122 445 446 447 448 465 466 467 468 RD1/4PS432JL
 R 123 RD1/4PS102JL
 R 126 129 RD1/4PS153JL

D 105 HZ3DP
 D 106 107 1SS133
 D 151 FMG-32S
 D 152 FMG-32R
 D 153 154 HZS16JB1

R 130 614 RD1/4PS223JL
 R 131 RD1/4PS184JL
 R 132 403 404 RD1/4PS224JL
 R 133 RD1/4PS363JL
 R 134 231 232 409 410 RD1/4PS333JL

D 155 156 RD3R3ESB2
 D 301 302 405 406 407 408 409 410 411 412 1SS133
 D 401 402 RD7R5JSB1
 D 403 404 HZS6B1L
 D 413 414 415 416 417 418 419 420 425 426 1SS133

R 135 505 506 507 508 517 518 519 520 604 RD1/4PS103JL
 R 151 152 611 RD1/4PS822JL
 R 155 156 475 476 477 478 RD1/4PS392JL
 R 201 202 203 204 RN1/4PC2202D
 R 205 206 207 208 RN1/4PC1002D

D 421 422 423 424 RD8R2JSB1
 D 427 428 429 430 431 432 604 1SS133
 D 501 502 503 504 1SS177
 D 601 RD6R8JSB2
 D 603 HZS9R7JB1

R 209 210 235 236 RN1/4PC1802D
 R 211 212 237 238 RN1/4PC1803D
 R 233 234 RN1/4PC9101D
 R 239 240 RD1/4PS471JL
 R 301 302 307 308 609 RD1/4PS104JL

D 605 HZS12JB2
 D 606 CXA2183
 L 1 2 LED Assy
 L 101 102 Ferrite Inductor
 L 104 CTH1086
 CTF-113

R 303 304 433 434 435 436 607 608 RD1/4PS473JL
 R 335 RD1/4PS471JL
 R 306 613 RD1/4PS722JL
 R 401 402 692 RD1/4PS221JL
 R 405 406 407 408 RD1/4PS682JL

L 151 152 Choke Coil
 L 501 502 CTH1088
 T CTH1014
 RY 301 CSR1015
 RY 301 CCR1012

R 411 412 437 438 439 440 RD1/4PS181JL
 R 413 414 423 424 425 426 RD1/4PS332JL
 R 415 416 RD1/4PS661JL
 R 417 418 419 420 429 430 431 432 605 RD1/4PS331JL
 R 421 422 521 522 533 534 535 536 537 538 RD1/4PS470JL

M 601 Motor Fan
 SW 1 CSM1047
 SW 2 CSM1021
 SW 3 CSM1025
 SW 3 HSH-156
 VR 1 CCS1183

R 427 428 RD1/4PS122JL
 R 441 442 443 444 501 502 503 504 513 514 RD1/4PS101JL
 R 449 450 451 452 485 486 487 488 RD1/4PS562JL
 R 453 454 455 456 RD1/4PS152JL

FU 1 2 Fuse 30A CEK1140
 EF 151 EMI Filter CCG1020

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.	Mark	====	Circuit Symbol & No.	====	Part Name	Part No.				
R	457	458	459	460	RD1/4PS821JL	C	413	414	415	416	CMA121J2H				
R	461	462	463	464	RD1/4PS820JL	C	417	418	419	420	CQMA102J50				
R	471	472			RD1/4PS680JL	C	421	422	423	424	CCPSL680J50L				
R	509	510			RD1/4PS561JL	C	425	426			CCPSL470J50L				
R	515	516			RD1/4PS101JL	C	427	428	429	430	CEA101M25L2				
R	523	524			RD1/4PS560JL	C	431	432	433	434	519	520	521	522	CFTMA104J50
R	525	526	527	528	529	530	531	532	RD1/4PS4R7JL	C	507	508	509	504	CMA470J2H
R	539	540			RD1/4PS470JL	C	505	506	507	508					CMA101J2H
R	541	542	543	544	0.33Ω × 2	CCN1041	C	509	510	511	512				CQMA104J50
R	545	546			RS2P101JL	C	513	514	515	516	1000μ F/40V				CCH1096
R	547	548			RS2P100JL	C	602								CEA220M16L2
R	601	619			RD1/4PS751JL	C	604				220μ F/10V				CCH1036
R	606				RD1/4PS123JL	C	605								CEA101M16L2
R	612				RS1/2P561JL	C	606								CEA4R7M50L2
R	616	617			RD1/4PS103JL										
R	620				RD1/4PS473JL										
R	621	622			RD1/4PS102JL										
R	623	624			RD1/4PS182JL										
R	625				RD1/4PS331JL										

CAPACITORS

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.	
C	1	2			CEA3R3M50L2	
C	3	4			CEA470M16L2	
C	5	6	11	12	CEA330M16L2	
C	7				CEA470M16L2	
C	13	14			CQMA103J50	
C	15	16	401	402	CKPYB221K50L	
C	21	22			CQMA104J50	
C	23	24	34		CKPYB391K50L	
C	25	26			CKPYB101K50L	
C	27	28			CKPYV103M16L	
C	31	32			CFTNA104J50	
C	33				CKPYB471K50L	
C	35	36			CEA101M10L2	
C	107	102	103	104	3900 μ F/16V	CCH1094
C	105	106				CQMA153J50
C	107					COPA10202A
C	108					CEA2R2M50L2
C	109			470 μ F/16V		CCH-114
C	110			470 μ F/16V		CCH-114
C	111	112				CQMA104J50
C	113	601	603		470 μ F/16V	CCH-114
C	115	116	117	118	607 608	CKCYF473250
C	151	152			5800 μ F/63V	CCH1091
C	153	154			1000 μ F/63V	CCH1090
C	155	156	157	158		CEA40470M50
C	159	160				CEA101M16L2
C	211	212	219	220		COPAN47302A
C	213	214				CEA100M16NPL1
C	215	216	405	406	411 412	CQMA103J50
C	217	218				CCCCN390J50
C	391	392	517	518		CQMA102J50
C	403	404				CQMA122J50
C	407	408				CEA221M50L2
C	409	410				CQMA561J50

8. CONNECTION DIAGRAM (GM-H200/UC)

AMP UNIT

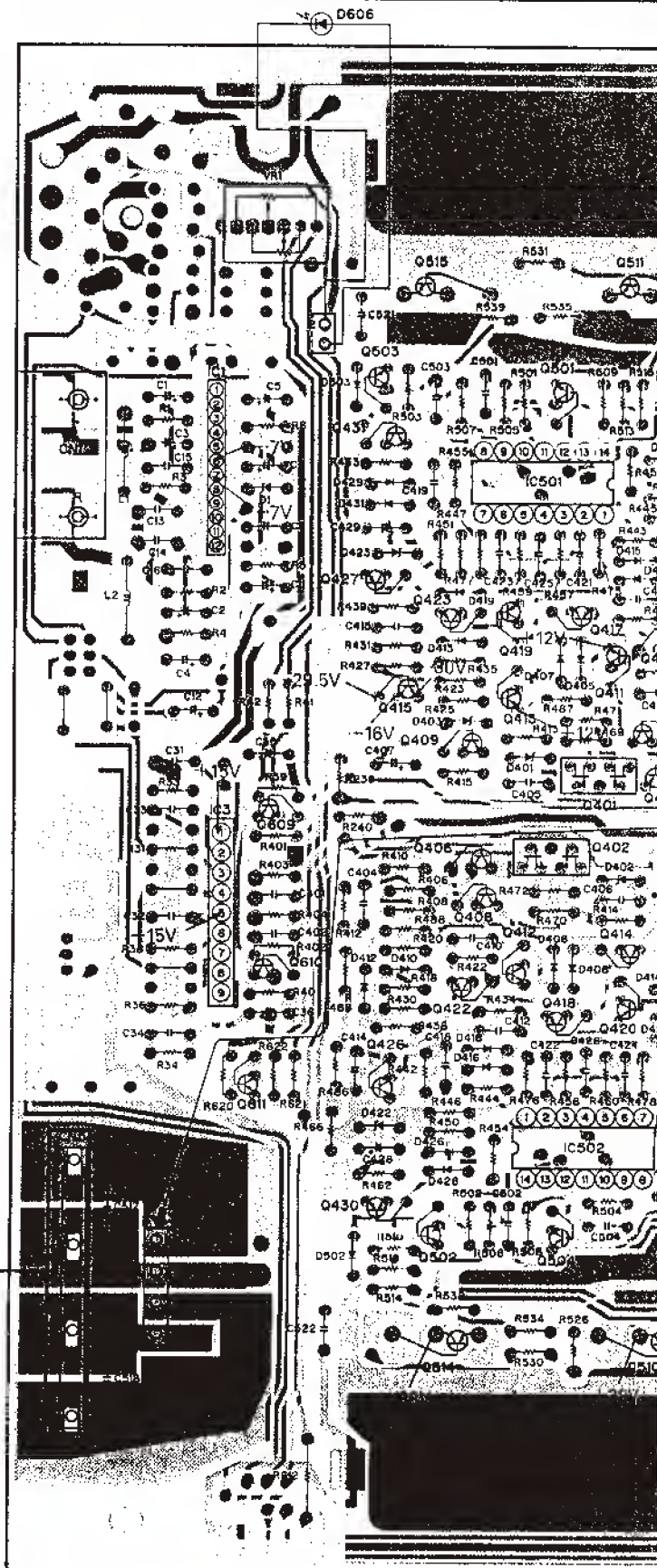
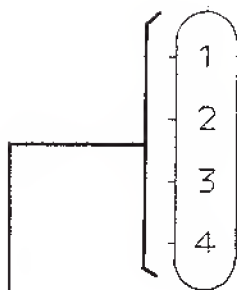
IC. Q Q609 Q503 Q431 Q422 Q409 IC501 Q417 Q411 Q42
 IC. Q Q611 Q610 Q426 Q427 Q502 Q406 Q412 Q504 Q414
 Q430 Q415 Q514 Q408 Q419 Q418 Q422

A

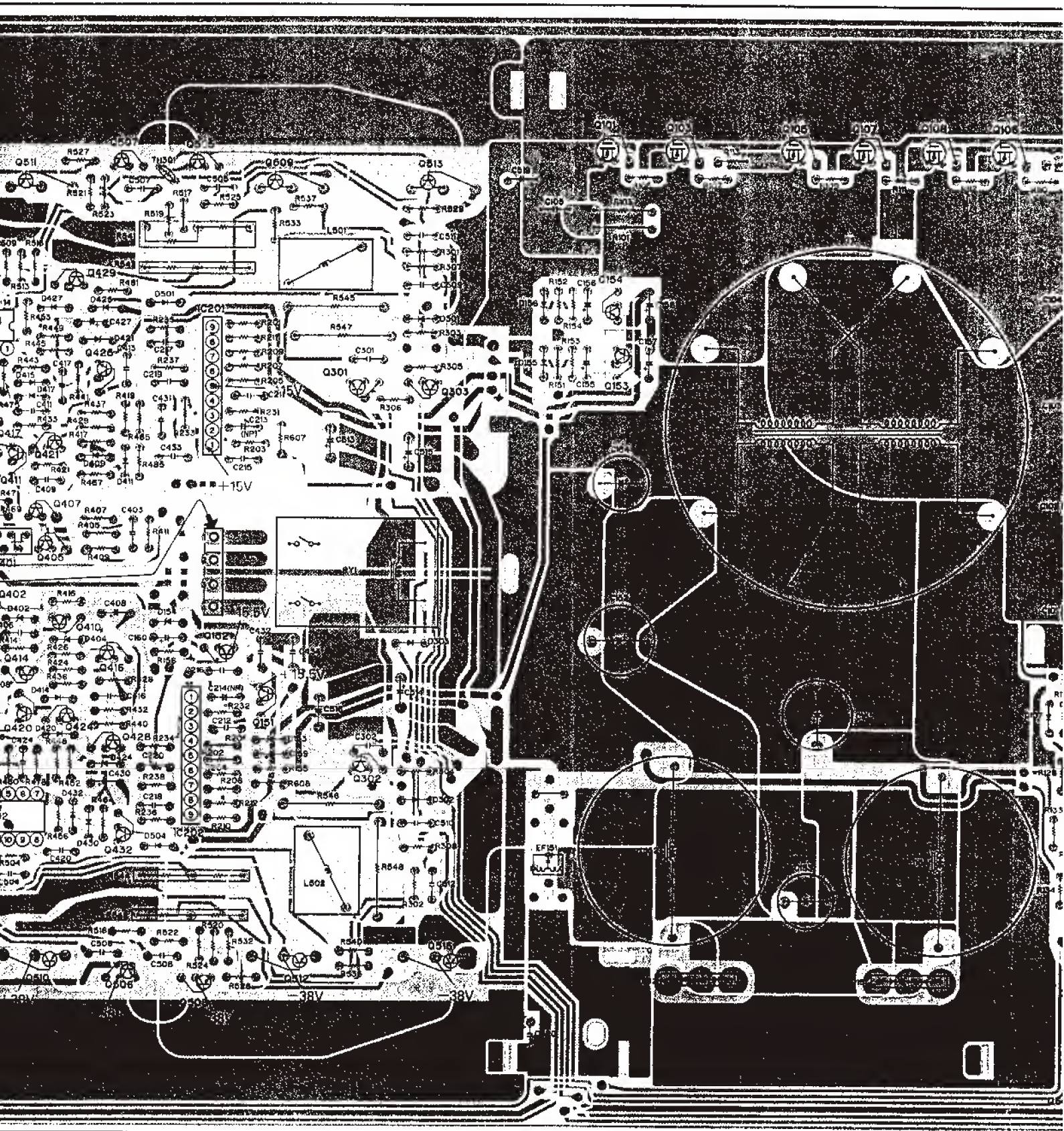
B

C

D



411 Q421 Q511
501 Q424 Q429 Q416
401 Q510 Q407 Q428 Q505
04 Q414 Q405 Q432 Q507 IC201 Q152 Q509
18 Q420 Q410 Q425 Q506 IC202 Q508 Q151 Q512 Q301 Q302 Q513
Q101 Q154 Q103 Q105 Q107 Q108 Q106



Q106 Q102 Q111
Q104 Q113 Q114 Q109
Q117 Q116 Q112 Q110 Q603 Q606 Q607
Q605 Q602 Q115 Q604 IC101 IC601 Q601 Q608

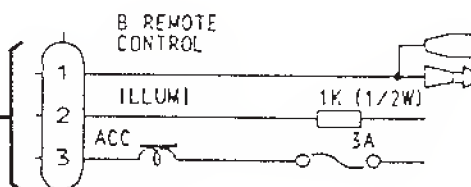
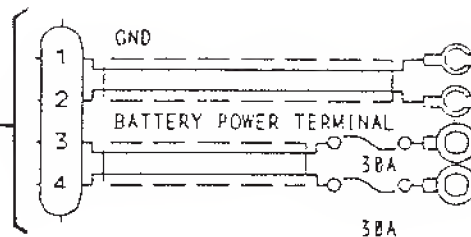
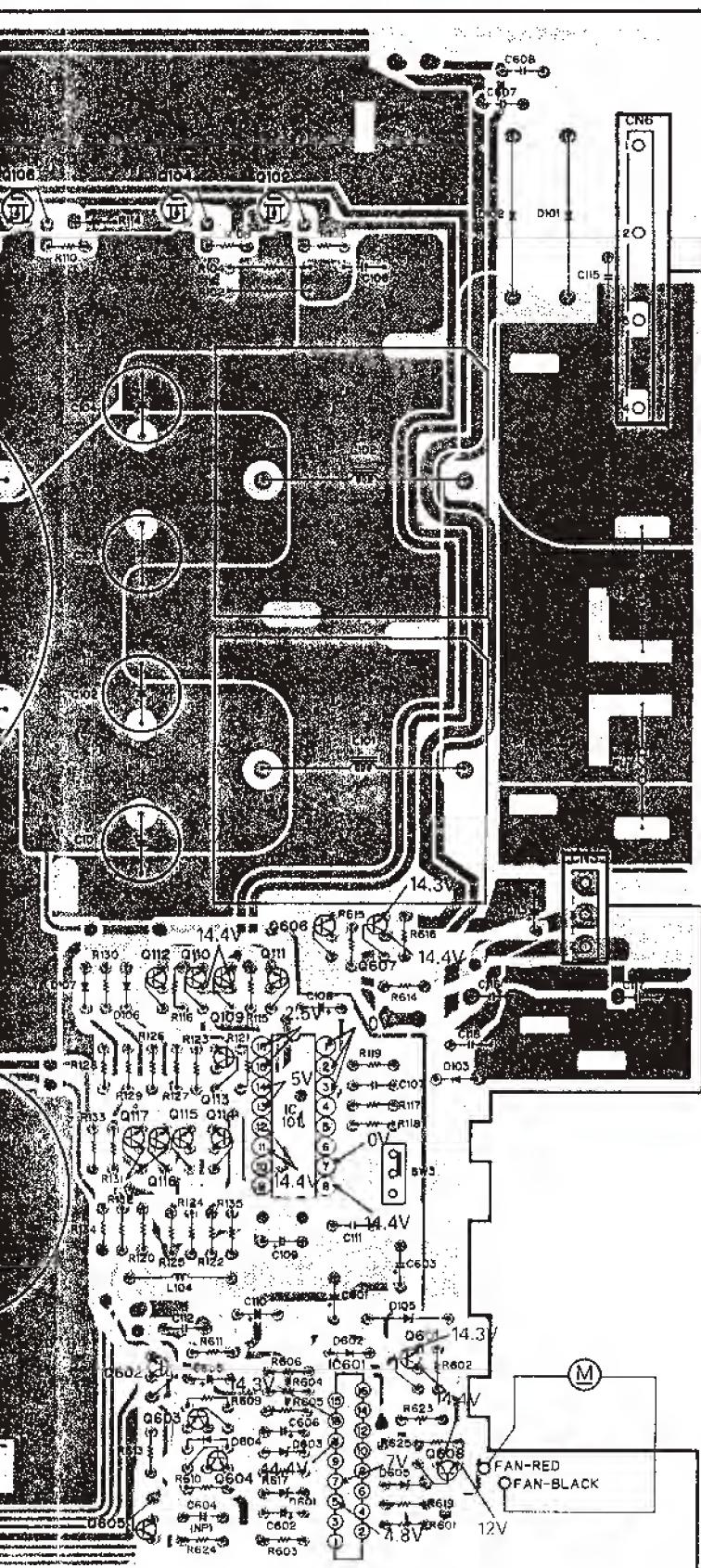


Fig. 8

11. CONNECTION DIAGRAM (GM-4200/EW)

A

B

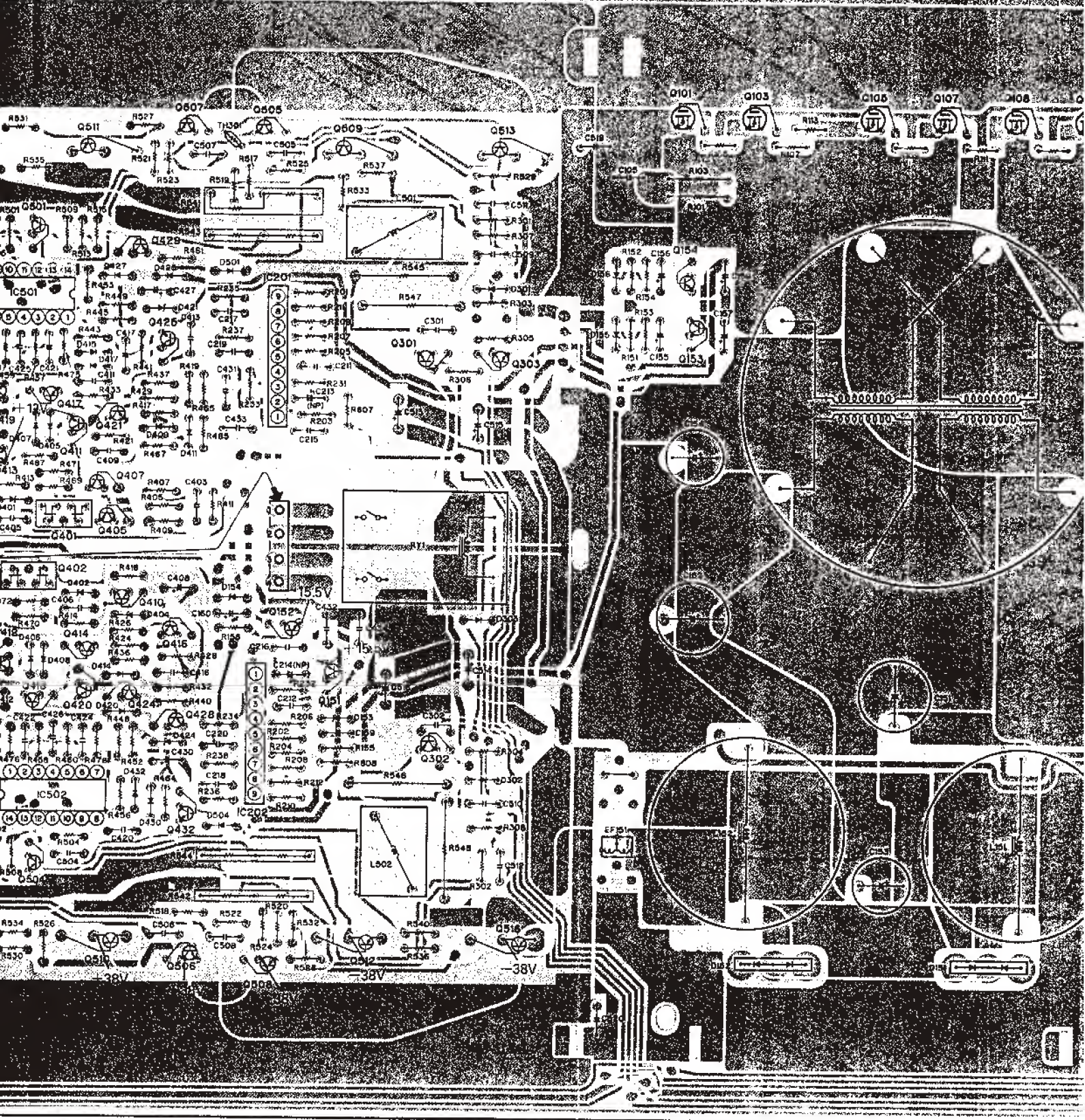
C

D

AMP UNIT

IC, Q		IC2	IC1	IC3	Q609	Q610	Q611	Q612	Q613	Q614	Q615	Q616	Q617	Q618	Q619	Q620	Q621	Q622	Q623	Q624	Q625	Q626	Q627	Q628	Q629	Q630	Q631	Q632	Q633	Q634	Q635	Q636	Q637	Q638	Q639	Q640	Q641	Q642	Q643	Q644	Q645	Q646	Q647	Q648	Q649	Q650	Q651	Q652	Q653	Q654	Q655	Q656	Q657	Q658	Q659	Q660	Q661	Q662	Q663	Q664	Q665	Q666	Q667	Q668	Q669	Q670	Q671	Q672	Q673	Q674	Q675	Q676	Q677	Q678	Q679	Q680	Q681	Q682	Q683	Q684	Q685	Q686	Q687	Q688	Q689	Q690	Q691	Q692	Q693	Q694	Q695	Q696	Q697	Q698	Q699	Q700	Q701	Q702	Q703	Q704	Q705	Q706	Q707	Q708	Q709	Q710	Q711	Q712	Q713	Q714	Q715	Q716	Q717	Q718	Q719	Q720	Q721	Q722	Q723	Q724	Q725	Q726	Q727	Q728	Q729	Q730	Q731	Q732	Q733	Q734	Q735	Q736	Q737	Q738	Q739	Q740	Q741	Q742	Q743	Q744	Q745	Q746	Q747	Q748	Q749	Q750	Q751	Q752	Q753	Q754	Q755	Q756	Q757	Q758	Q759	Q760	Q761	Q762	Q763	Q764	Q765	Q766	Q767	Q768	Q769	Q770	Q771	Q772	Q773	Q774	Q775	Q776	Q777	Q778	Q779	Q780	Q781	Q782	Q783	Q784	Q785	Q786	Q787	Q788	Q789	Q790	Q791	Q792	Q793	Q794	Q795	Q796	Q797	Q798	Q799	Q800	Q801	Q802	Q803	Q804	Q805	Q806	Q807	Q808	Q809	Q810	Q811	Q812	Q813	Q814	Q815	Q816	Q817	Q818	Q819	Q820	Q821	Q822	Q823	Q824	Q825	Q826	Q827	Q828	Q829	Q830	Q831	Q832	Q833	Q834	Q835	Q836	Q837	Q838	Q839	Q840	Q841	Q842	Q843	Q844	Q845	Q846	Q847	Q848	Q849	Q850	Q851	Q852	Q853	Q854	Q855	Q856	Q857	Q858	Q859	Q860	Q861	Q862	Q863	Q864	Q865	Q866	Q867	Q868	Q869	Q870	Q871	Q872	Q873	Q874	Q875	Q876	Q877	Q878	Q879	Q880	Q881	Q882	Q883	Q884	Q885	Q886	Q887	Q888	Q889	Q890	Q891	Q892	Q893	Q894	Q895	Q896	Q897	Q898	Q899	Q900	Q901	Q902	Q903	Q904	Q905	Q906	Q907	Q908	Q909	Q910	Q911	Q912	Q913	Q914	Q915	Q916	Q917	Q918	Q919	Q920	Q921	Q922	Q923	Q924	Q925	Q926	Q927	Q928	Q929	Q930	Q931	Q932	Q933	Q934	Q935	Q936	Q937	Q938	Q939	Q940	Q941	Q942	Q943	Q944	Q945	Q946	Q947	Q948	Q949	Q950	Q951	Q952	Q953	Q954	Q955	Q956	Q957	Q958	Q959	Q960	Q961	Q962	Q963	Q964	Q965	Q966	Q967	Q968	Q969	Q970	Q971	Q972	Q973	Q974	Q975	Q976	Q977	Q978	Q979	Q980	Q981	Q982	Q983	Q984	Q985	Q986	Q987	Q988	Q989	Q990	Q991	Q992	Q993	Q994	Q995	Q996	Q997	Q998	Q999	Q1000	Q1001	Q1002	Q1003	Q1004	Q1005	Q1006	Q1007	Q1008	Q1009	Q1010	Q1011	Q1012	Q1013	Q1014	Q1015	Q1016	Q1017	Q1018	Q1019	Q1020	Q1021	Q1022	Q1023	Q1024	Q1025	Q1026	Q1027	Q1028	Q1029	Q1030	Q1031	Q1032	Q1033	Q1034	Q1035	Q1036	Q1037	Q1038	Q1039	Q1040	Q1041	Q1042	Q1043	Q1044	Q1045	Q1046	Q1047	Q1048	Q1049	Q1050	Q1051	Q1052	Q1053	Q1054	Q1055	Q1056	Q1057	Q1058	Q1059	Q1060	Q1061	Q1062	Q1063	Q1064	Q1065	Q1066	Q1067	Q1068	Q1069	Q1070	Q1071	Q1072	Q1073	Q1074	Q1075	Q1076	Q1077	Q1078	Q1079	Q1080	Q1081	Q1082	Q1083	Q1084	Q1085	Q1086	Q1087	Q1088	Q1089	Q1090	Q1091	Q1092	Q1093	Q1094	Q1095	Q1096	Q1097	Q1098	Q1099	Q1100	Q1101	Q1102	Q1103	Q1104	Q1105	Q1106	Q1107	Q1108	Q1109	Q1110	Q1111	Q1112	Q1113	Q1114	Q1115	Q1116	Q1117	Q1118	Q1119	Q1120	Q1121	Q1122	Q1123	Q1124	Q1125	Q1126	Q1127	Q1128	Q1129	Q1130	Q1131	Q1132	Q1133	Q1134	Q1135	Q1136	Q1137	Q1138	Q1139	Q1140	Q1141	Q1142	Q1143	Q1144	Q1145	Q1146	Q1147	Q1148	Q1149	Q1150	Q1151	Q1152	Q1153	Q1154	Q1155	Q1156	Q1157	Q1158	Q1159	Q1160	Q1161	Q1162	Q1163	Q1164	Q1165	Q1166	Q1167	Q1168	Q1169	Q1170	Q1171	Q1172	Q1173	Q1174	Q1175	Q1176	Q1177	Q1178	Q1179	Q1180	Q1181	Q1182	Q1183	Q1184	Q1185	Q1186	Q1187	Q1188	Q1189	Q1190	Q1191	Q1192	Q1193	Q1194	Q1195	Q1196	Q1197	Q1198	Q1199	Q1200	Q1201	Q1202	Q1203	Q1204	Q1205	Q1206	Q1207	Q1208	Q1209	Q1210	Q1211	Q1212	Q1213	Q1214	Q1215	Q1216	Q1217	Q1218	Q1219	Q1220	Q1221	Q1222	Q1223	Q1224	Q1225	Q1226	Q1227	Q1228	Q1229	Q1230	Q1231	Q1232	Q1233	Q1234	Q1235	Q1236	Q1237	Q1238	Q1239	Q1240	Q1241	Q1242	Q1243	Q1244	Q1245	Q1246	Q1247	Q1248	Q1249	Q1250	Q1251	Q1252	Q1253	Q1254	Q1255	Q1256	Q1257	Q1258	Q1259	Q1260	Q1261	Q1262	Q1263	Q1264	Q1265	Q1266	Q1267	Q1268	Q1269	Q1270	Q1271	Q1272	Q1273	Q1274	Q1275	Q1276	Q1277	Q1278	Q1279	Q1280	Q1281	Q1282	Q1283	Q1284	Q1285	Q1286	Q1287	Q1288	Q1289	Q1290	Q1291	Q1292	Q1293	Q1294	Q1295	Q1296	Q1297	Q1298	Q1299	Q1300	Q1301	Q1302	Q1303	Q1304	Q1305	Q1306	Q1307	Q1308	Q1309	Q1310	Q1311	Q1312	Q1313	Q1314	Q1315	Q1316	Q1317	Q1318	Q1319	Q1320	Q1321	Q1322	Q1323	Q1324	Q1325	Q1326	Q1327	Q1328	Q1329	Q1330	Q1331	Q1332	Q1333	Q1334	Q1335	Q1336	Q1337	Q1338	Q1339	Q1340	Q1341	Q1342	Q1343	Q1344	Q1345	Q1346	Q1347	Q1348	Q1349	Q1350	Q1351	Q1352	Q1353	Q1354	Q1355	Q1356	Q1357	Q1358	Q1359	Q1360	Q1361	Q1362	Q1363	Q1364	Q1365	Q1366	Q1367	Q1368	Q1369	Q1370	Q1371	Q1372	Q1373	Q1374	Q1375	Q1376	Q1377	Q1378	Q1379	Q1380	Q1381	Q1382	Q1383	Q1384	Q1385	Q1386	Q1387	Q1388	Q1389	Q1390	Q1391	Q1392	Q1393	Q1394	Q1395	Q1396	Q1397	Q1398	Q1399	Q1400	Q1401	Q1402	Q1403	Q1404	Q1405	Q1406	Q1407	Q1408	Q1409	Q1410	Q1411	Q1412	Q1413	Q1414	Q1415	Q1416	Q1417	Q1418	Q1419	Q1420	Q1421	Q1422	Q1423	Q1424	Q1425	Q1426	Q1427	Q1428	Q1429	Q1430	Q1431	Q1432	Q1433	Q1434	Q1435	Q1436	Q1437	Q1438	Q1439	Q1440	Q1441	Q1442	Q1443	Q1444	Q1445	Q1446	Q1447	Q1448	Q1449	Q1450	Q1451	Q1452	Q1453	Q1454	Q1455	Q1456	Q1457	Q1458	Q1459	Q1460	Q1461	Q1462	Q1463	Q1464	Q1465	Q1466	Q1467	Q1468	Q1469	Q1470	Q1471	Q1472	Q1473	Q1474	Q1475	Q1476	Q1477	Q1478	Q1479	Q1480	Q1481	Q1482	Q1483	Q1484	Q1485	Q1486	Q1487	Q1488	Q1489	Q1490	Q1491	Q1492	Q1493	Q1494	Q1495	Q1496	Q1497	Q1498	Q1499	Q1500	Q1501	Q1502	Q1503	Q1504	Q1505	Q1506	Q1507	Q1508	Q1509	Q1510	Q1511	Q1512	Q1513	Q1514	Q1515	Q1516	Q1517	Q1518	Q1519	Q1520	Q1521	Q1522	Q1523	Q1524	Q1525	Q1526	Q1527	Q1528	Q1529	Q1530	Q1531	Q1532	Q1533	Q1534	Q1535	Q1536	Q1537	Q1538	Q1539	Q1540	Q1541	Q1542	Q1543	Q1544	Q1545	Q1546	Q1547	Q1548	Q1549	Q1550	Q1551	Q1552	Q1553	Q1554	Q1555	Q1556	Q1557	Q1558	Q1559	Q1560	Q1561	Q1562	Q1563	Q1564	Q1565	Q1566	Q1567	Q1568	Q1569	Q1570	Q1571	Q1572	Q1573	Q1574	Q1575	Q1576	Q1577	Q1578	Q1579	Q1580	Q1581	Q1582	Q1583	Q1584	Q1585	Q1586	Q1587	Q1588	Q1589	Q1590	Q1591	Q1592	Q1593	Q1594	Q1595	Q1596	Q1597	Q1598	Q1599	Q1600	Q1601	Q1602	Q1603	Q1604	Q1605	Q1606	Q1607	Q1608	Q1609	Q1610	Q1611	Q1612	Q1613	Q1614	Q1615	Q1616	Q1617	Q1618	Q1619	Q1620	Q1621	Q1622	Q1623	Q1624	Q1625	Q1626	Q1627	Q1628	Q1629	Q1630	Q1631	Q1632	Q1633	Q1634	Q1635	Q1636	Q1637	Q1638	Q1639	Q1640	Q1641	Q1642	Q1643	Q1644	Q1645	Q1646	Q1647	Q1648	Q1649	Q1650	Q1651	Q1652	Q1653	Q1654	Q1655	Q1656	Q1657	Q1658	Q1659	Q1660	Q1661	Q1662	Q1663	Q1664	Q1665	Q1666	Q1667	Q1668	Q1669	Q1670	Q1671	Q1672	Q1673	Q1674	Q1675	Q1676	Q1677	Q1678	Q1679	Q1680	Q1681	Q1682	Q1683	Q1684	Q1685	Q1686	Q1687	Q1688	Q1689	Q1690	Q1691	Q1692	Q1693	Q1694	Q1695	Q1696	Q1697	Q1698	Q1699	Q1700	Q1701	Q1702	Q1703	Q1704	Q1705	Q1706	Q1707	Q1708	Q1709	Q1710	Q1711	Q1712	Q1713	Q1714	Q1715	Q1716	Q1717	Q1718	Q1719	Q1720	Q1721	Q1722	Q1723	Q1724	Q1725	Q1726	Q1727	Q1728	Q1729	Q1730	Q1731	Q1732	Q1733	Q1734	Q1735	Q1736	Q1737	Q1738	Q1739	Q1740	Q1741	Q1742	Q1743	Q1744	Q1745	Q1746	Q1747	Q1748	Q1749	Q1750	Q1751	Q1752	Q1753	Q1754	Q1755	Q1756	Q1757	Q1758	Q1759	Q1760	Q1761	Q1762	Q1763	Q1764	Q1765	Q1766	Q1767	Q1768	Q1769	Q1770	Q1771	Q1772	Q1773	Q1774	Q1775	Q1776	Q1777	Q1778	Q1779	Q1780	Q1781	Q1782	Q1783	Q1784	Q1785	Q1786	Q1787	Q1788	Q1789	Q1790	Q1791	Q1792	Q1793	Q1794	Q1795	Q1796	Q1797	Q1798	Q1799	Q1800	Q1801	Q1802	Q1803	Q1804	Q1805	Q1806	Q1807	Q1808	Q1809	Q1810	Q1811	Q1812	Q1813	Q1814	Q1815	Q1816	Q1817	Q1818	Q1819	Q1820	Q1821	Q1822	Q1823	Q1824	Q1825	Q1826	Q1827	Q1828	Q1829	Q1830	Q1831	Q1832	Q1833	Q1834	Q1835	Q1836	Q1837	Q1838	Q1839	Q1840	Q1841	Q1842	Q1843	Q1844	Q1845	Q1846	Q1847	Q1848	Q1849	Q1850	Q1851	Q1852	Q1853
-------	--	-----	-----	-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------

1 Q417 Q411 Q421 Q511
3 Q402 Q501 Q424 Q429 Q416
9 IC502 Q401 Q510 Q407 Q428
5 Q412 Q504 Q414 Q405 Q432 Q507 IC201 Q152 Q509
8 Q419 Q418 Q420 Q410 Q425 Q506 IC202 Q508 Q151 Q512 Q301 Q302 Q513 Q516 Q303 Q101 Q154 Q103 Q105 Q107 Q108



Q104 Q102 Q111
Q117 Q116 Q114 Q109
Q112 Q110 Q603
Q605 Q602 Q115 Q604 IC101 IC601 Q601 Q608

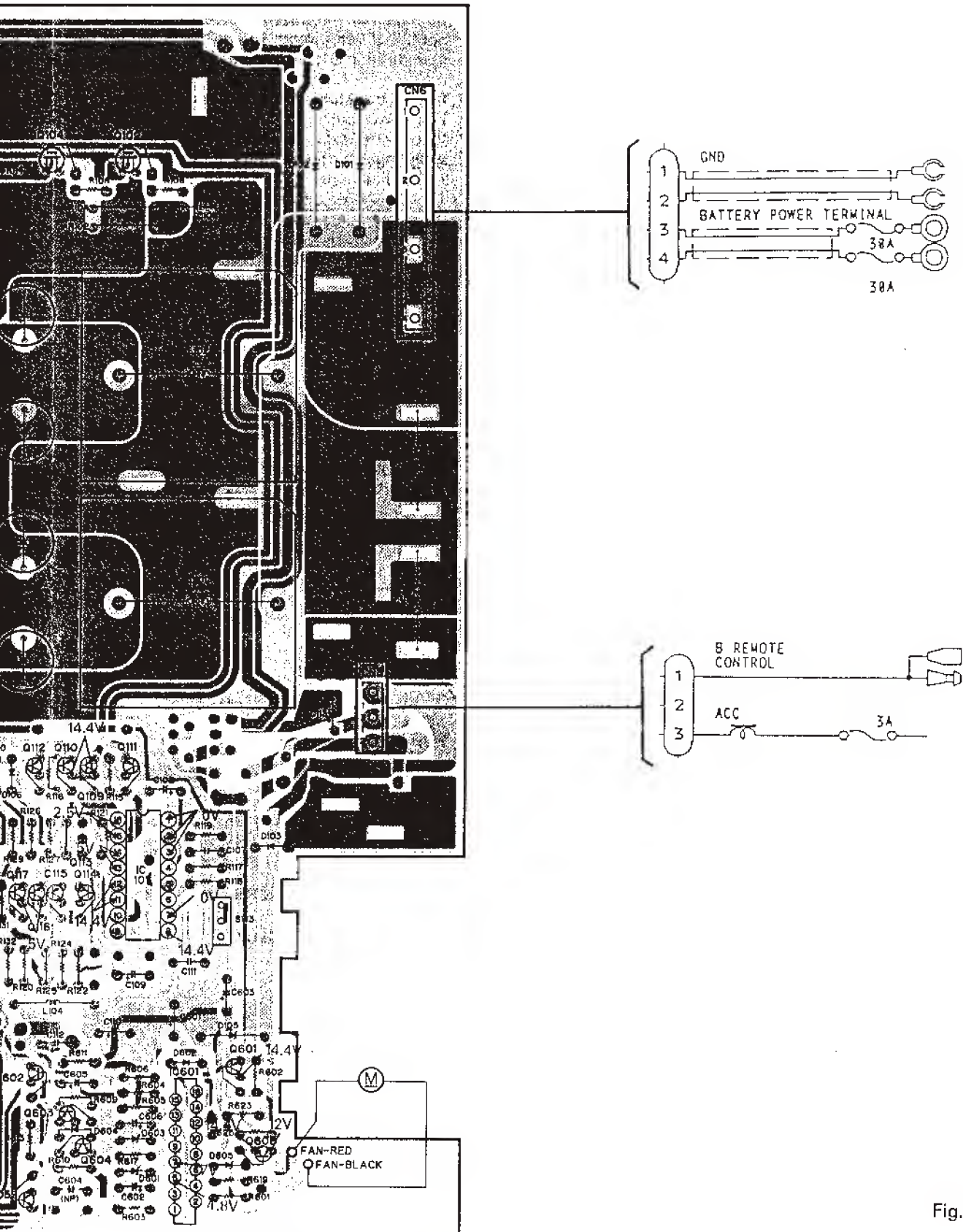
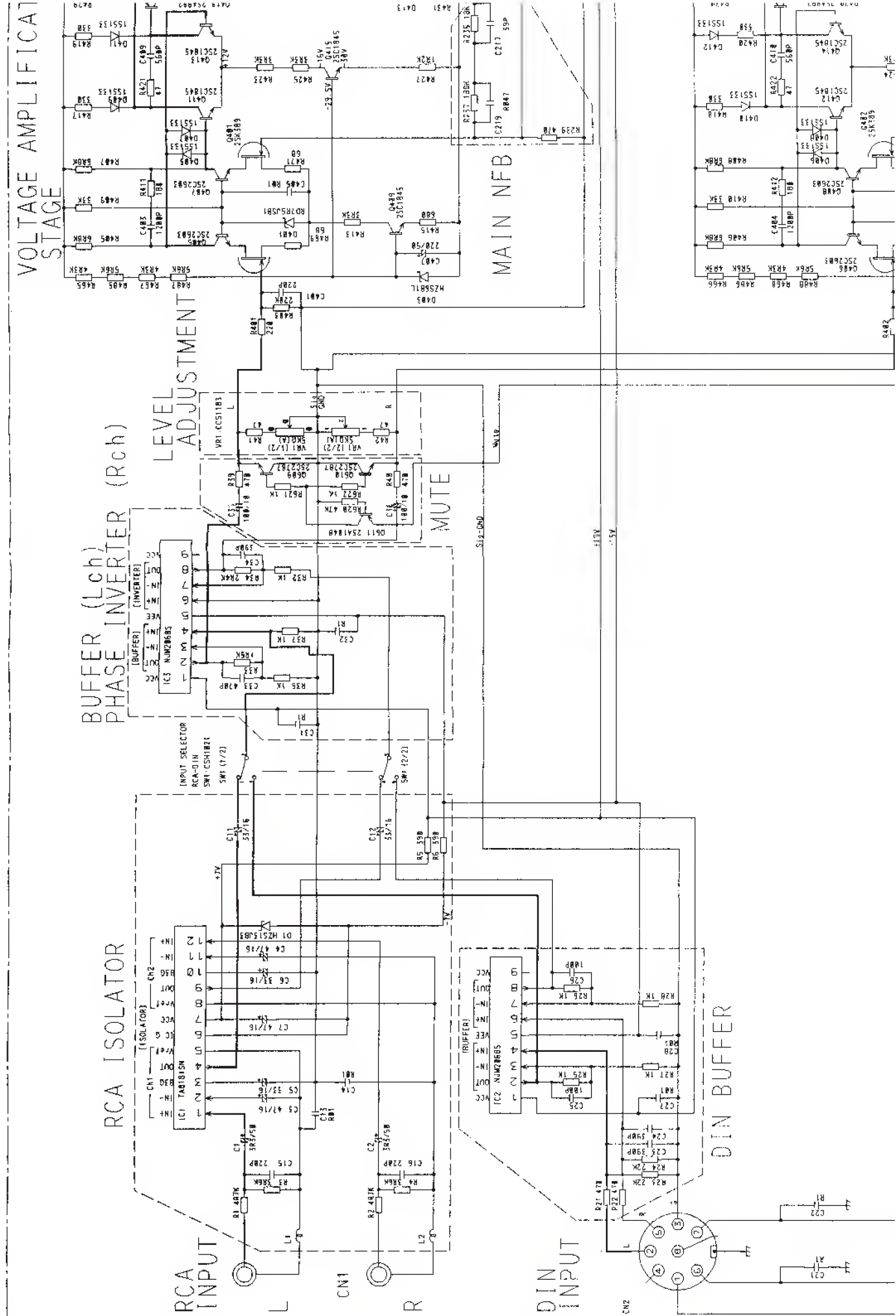
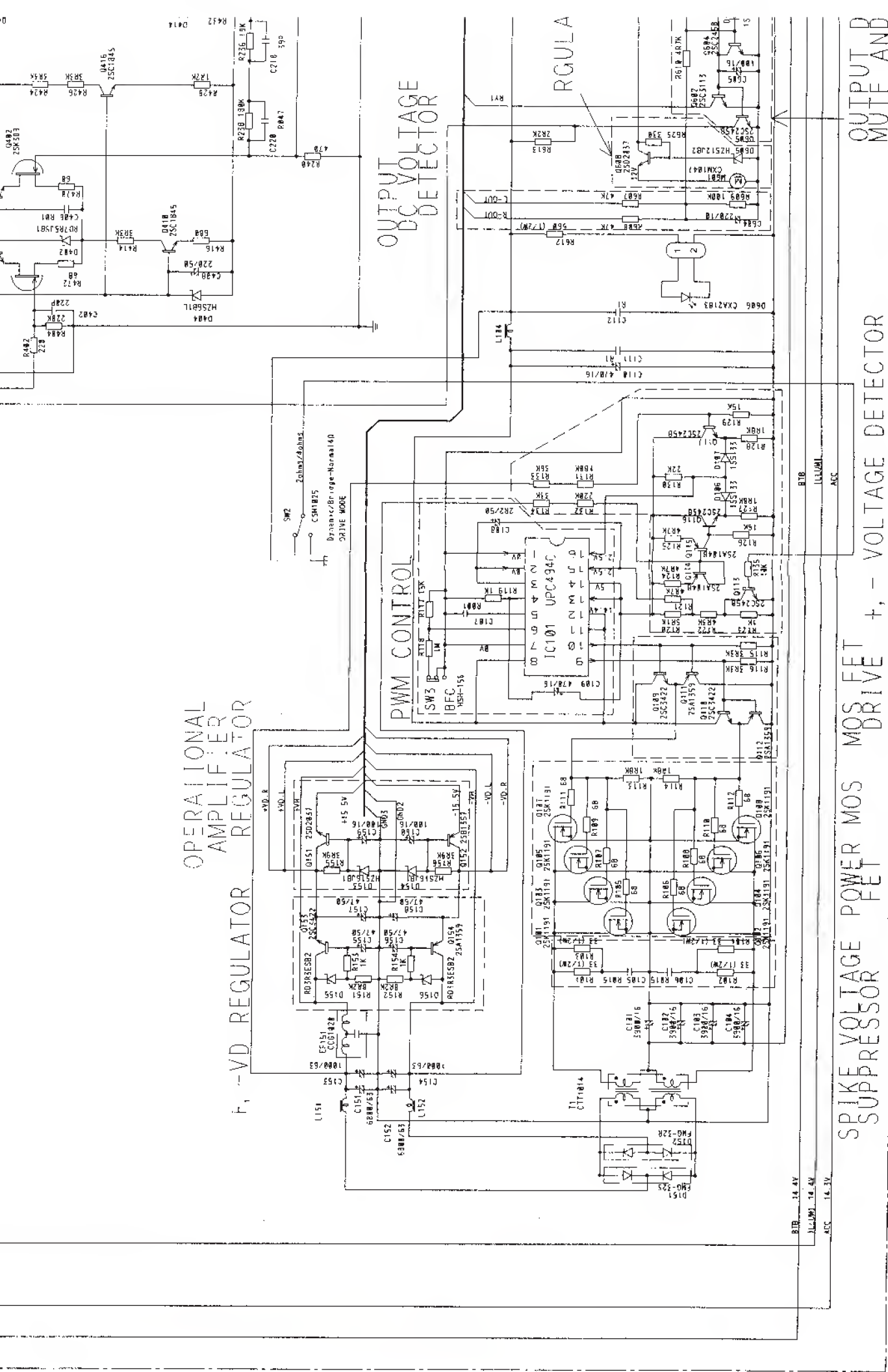


Fig. 5

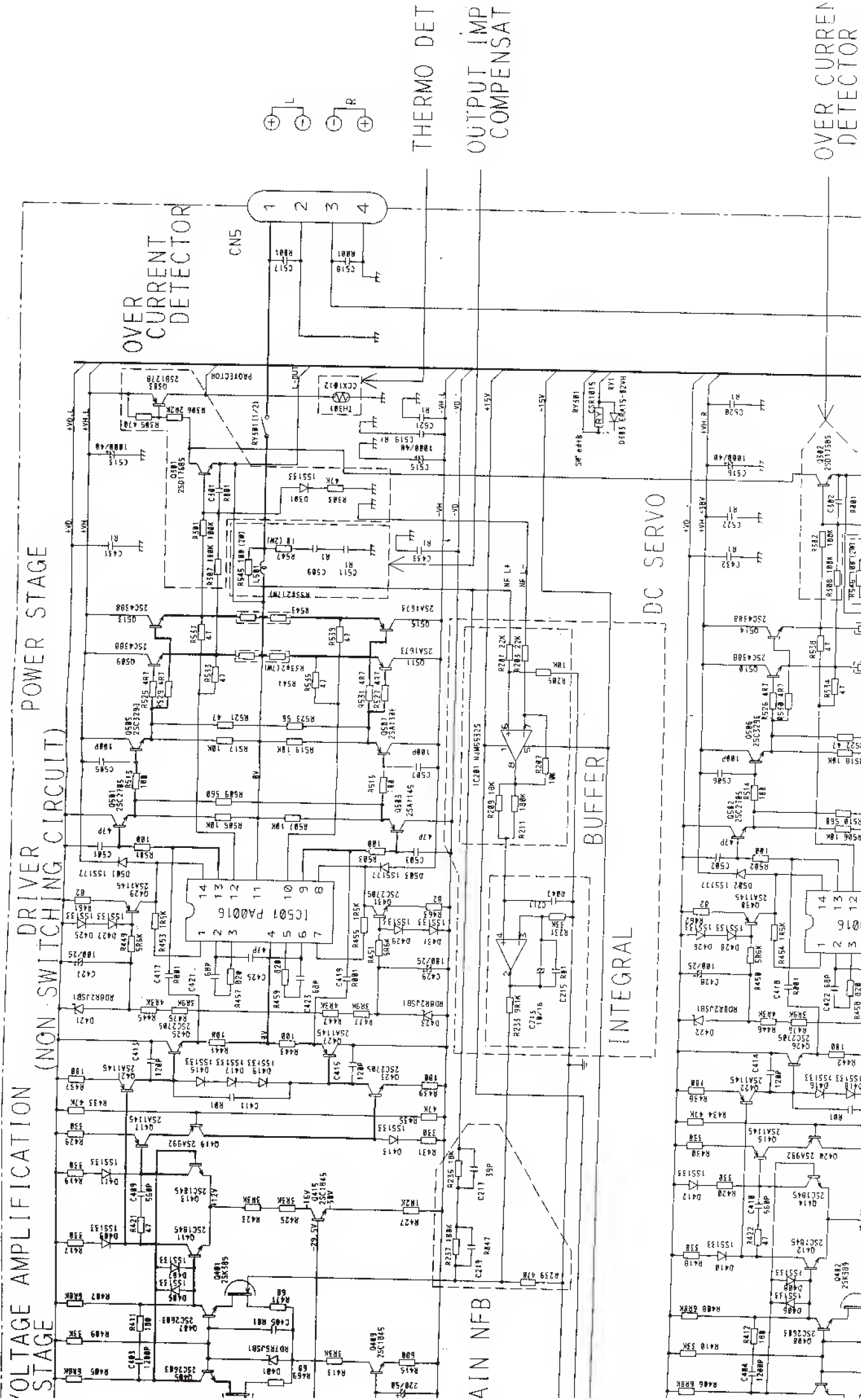
10. SCHEMATIC CIRCUIT DIAGRAM (GM-4200/EW)

200
SCHEMATIC
AMP UNIT





NOTE:
 □ Symbol in
 - Symbol in



THERMO DET
OUTPUT IMP
COMPENSAT

OVER CURREN
DETECTOR

OVER CURRENT
DETECTOR

OUTPUT IMP
COMPENSAT

OUTPUT VOLTAGE
DC VOLTAGE
DETECTOR

POWER CONTROL
MUTE CONTROL

REGULATOR

